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THE

Archives of Dentistry.

A MONTHLY RECORD OF DENTAL SCIENCE AND ART.

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ORIGINAL ARTICLES.

> "Of all the arts in which the wise excel,
> Nature's chief masterpiece is writing well."

MATERIALS AND MANIPULATION.

BY EDGAR PARK, D. D S.

Read before the St. Louis Dental Society.

I shall briefly consider the subject from a standpoint of personal observation and experience. I take it that every material in general use possesses some quality to recommend it. It is apparent that the demand creates the supply, and the modest man will scarcely totally ignore the convictions of numbers of reputable men, because their practice may not exactly harmonize with his. The moderate disciple of the "new departure" may fairly acknowledge that in the hands of some operators, gold may be successfully used as a material for arresting decay in the teeth; while of the anti-amalgam men, many now accept some of these alloys as being perhaps the most desirable agent with which to subserve one's wants in certain cases.

In the case of filling the deciduous teeth, where the filling is to occupy a position exposed to mastication for instance, or in the case of the applicant, who cannot afford to remunerate the operator for the material, time and skill necessary to be expended upon a gold filling, its value is not to be under-estimated. Amalgam will save the teeth; we have all seen proof of this, and consequently it commends itself to us. In the discharge of our duty to the poor, remembering our duty to ourselves, I know of no agent by whose employment we can furnish to the patient so great satisfaction in return for the expenditure of their limited means.

There are seductive features possessed by this material against which it is well to guard one's self, as the temptation it offers to economize time, relieve anxiety, avoid labor, or the gratification of any other selfish motive.

To my mind its use for a permanent purpose, in cases where a fair compensation is obtainable, is unwise, and not worthy of the act of a skilled practitioner.

There is something more demanded of the dentist, than the mere saving of a tooth to usefulness. This first object having been accomplished, the appearance his operation presents, must never be lost sight of. The intelligent patron presents himself to the dentist, because he has confidence in his ability and integrity, depending upon his professional judgment and skill, to do the best thing his case requires, and I must say, my honest convictions are that this is not to be done by the use of amalgam in filling the teeth.

My own experience in the use of amalgam, is somewhat limited, but my observation prejudices me against its use; not only because of the objectionable appearance of the plug itself from oxidation, but because nearly every tooth I have ever seen filled with it, has become discolored in consequence of its use. It is claimed for some of the recent alloys, that these objections have been overcome. If this proves to be true, I am not sure but my prejudices may in time be upset.

The color of the newly finished amalgam plug, is perhaps less objectionable than that of any other metallic filling; if one can be fair and ignore the popular predilection for the material which has so long endured the onslaught of innovating competitors, and which we may still denominate the "old reliable."

But before passing the subject, there are other preparations to which a word is due. Hill's Stopping, and like preparations, embodying a large proportion of gutta percha, are among the most valuable and indispensible agents, in operations upon carious teeth. It is especially desirable, because of the various demands which it supplies, because of the facility with which it may be used, of the comfort to the patient, with which it may be inserted, requiring little mechanical force, occasioning no pain from chemical or galvanic action, and because of the satisfaction with which it may be worn, providing the most perfect protection against the distress occasioned by thermal changes in deeply decayed teeth, The only argument which can be successfully urged against this material, is its destructibility. With this exception, it embodies a greater number of essentials requisite for a perfect filling material, than any other; and in some of its most important uses, this objection amounts to nothing, in its use as a filling in root canals, for instance, or for any other purpose where its protection from mechanical action is secured.

This objection to its use, where its surface is exposed only to the secretions of the mouth, is practically of no moment. Ten or twelve years integrity as a stopping, should be satisfactory endorsement of its value as a filling material, and this is not too much to expect of it in favorable locations. In such it may properly be depended upon as a permanent filling. As a temporary filling, the facility with which it may be removed and replaced at any time, recommends it.

To secure the best results, as perfect preparation of the cavity is necessary, as for any other material, and as careful protection against moisture is demanded in the introduction of the filling, which feature in the operation must also be performed with the utmost care. Suitable instruments are as necessary for the proper working of this material, as for gold or any other, and without them, the best results cannot be expected.

The method of its introduction into the cavity, not unlike other materials, varies with the peculiarities of the case presented, and a satisfactory result demands the best judgment of the operator. With proper care, a satisfactory result is comparatively easy of attainment, but neglect of proper precaution will as certainly result in failure, as would the indifferent use of any other material. Danger of failure, threatens in proportion to the degree of carelessness, induced by the simplicity of the task to be undertaken, while success attends our efforts in ratio with the degree of anxiety and purpose excited by the difficulties presented. Not unlike other materials, experience will be found no disadvantage.

This material has been criticized as a filling, by some experimenters, and pronounced unreliable, because they failed with it to seal perfectly a glass tube. It may not have occurred to every one that it was not designed for that purpose, and possibly, perhaps probably, it will not accomplish that result, but that it will fill a cavity in a tooth perfectly, to all intents and purposes, I assert. To most persons the difference between the vitreous homogenous surface of a glass tube, and the irregular, cellular structure of the walls of a cavity in a tooth would suggest itself, and that while an article might fail to accomplish a purpose for which it was never intended, it might nevertheless effect a most satisfactory result when used for the purpose designated.

Of oxychlorides, I have yet to see the preparation in which I feel confidence. While in some mouths it answers a good purpose, in others it is absolutely worthless, and I know of no means of determining in what cases it will prove lasting, and considering the uncertainty attending its use I have almost entirely abandoned it. I had hoped that in Fletcher's Dental Porcelain I should find the satisfaction promised in the announcement accompanying the article, but on this have been subjected to disappointment. It may be in consequence of my inexperience in its use, but I certainly do not feel disposed to attribute unsatisfactory results entirely to its unskillful manipulation, and I would suggest that too much faith be not put in its promised merits. The fact is, to secure the best results our best efforts must be called out. In the sweat of the brow shalt thou eat bread was the edict that went forth ages ago. And to no class of men does this undeviating law apply with greater force than to ourselves. There is no royal road of ease to success in the legitimate practice of our pursuit and to secure the best results we must avoid humoring the desire to find a means of relief from the earnest, determined effort which we know is necessary to success in the use of the material which is par-excellence *the* material with which to secure the best results in operations upon the teeth. For general use the results attainable challenge comparison. I don't know that is too much to say, that in any tooth susceptible of being well filled, the object is attainable by the use of gold, in one or another of the various forms in which we have it furnished. Perhaps in some conditions of the teeth it may be advisable to employ in connection other preparations at our hand. Hill's Stopping for instance as an insulator where the pulp is closely encroached upon by decay. This substance may also be advantageously used against the walls of cavities where the condition indicates the necessity for protection against the force necessary in use of cohesive gold; but as a material for the main body of the plug, gold is unequaled. I believe that in every case where it has failed to prove satisfactory, the fault has not been in the material, but in the operator, by a want of judgment in failing to recognize the special form adaptable to the peculiar conditions of the case, or by faulty manipulation. There is scarcely an end to the various conditions which we find in the structure of the teeth in different cases, and recognizing this, to expect uniform results, from a uniform method of using some one form of gold exclusively, is to say the least, short sighted. The best operations cannot be produced by the exclusive use of any one preparation. Now, very heavy gold is a good thing in its proper place. To expect a good result by its exclusive use in a tooth where dentine is soft and easily defaced would indicate the utmost thoughtlessness. If the structure is sufficiently dense it matters little what form of gold is used, by the use of any a perfect result may be achieved, manipulation and amount of labor varying with the selection made. As a rule I believe the principle most generally adopted in the use of gold is distinction, in theory at least, and if not in practice, the fortunate successes do not disprove my argument, they only prove the density of the tooth, and furnish evidence of the indestructible surfaces which offered resistance to the force employed. I refer to the very general use of cohesive gold, ordinarily used in a manner necessitating much force in breaking down innumerable angles and reducing the particles as introduced to a solid mass by the malleable property of the metal, obliterating the countless irregular interstices formed by cohesion at every point of contact. Where the dentine is sufficiently firm to furnish the resistance necessary without defacing or bruising the structure, well and good, it's lucky for the patient, but I maintain that the principle is all wrong. A more rational one to adopt, it seems to me is to depend upon a form of gold which can be introduced without displacing its arrangement and confined by mechanical disposition. This may be done with non-cohesive gold, introduced in cylinder form, and in such a way that the last introduced always serves to more densely confine against the walls, the cylinders previously adjusted. In this way the force is recoiled against the walls in so general a manner that to injure the structure of the walls is impossible. This involves no process of welding, and relieves the tooth from the severe usage necessary to reduce cohesive gold into a solid mass. The surfaces of the foil are in plain relation to one another, and being non-cohesive yield to moderate pressure and more readily and perfectly adapt themselves to any inequality of surface against which they may be forced. Another consideration in favor of the use of this form of gold is the saving of time to the operator and of fatigue to the patient, the operation of filling being largely accomplished out of the mouth and at one's leisure. Having said this in favor of non-cohesive gold, I must at the same time acknowledge my dependence upon cohesive gold every day of my life at stages of every operation. I don't know that there is a preparation of gold to which I would offer an objection. All are reliable if expertly used by men whose effort are directed by the promptings of a sound judgment.

STILL ANOTHER.

BY J. RICHARDSON, M. D. D. D. S., TERRE-HAUTE, IND.

Within the past few years, and especially of late, the most valuable contributions to the department of practical dentistry, and especially to dental prosthetics, have been in the direction of improved methods of attaching artificial crowns to the roots of the natural teeth. Every conscientious and conservative operator recognizing the importance and value of utilizing, in all practicable cases, the remains of hopelessly decayed crowns of teeth in the manner indicated, and so prolific has been invention in the way of devices to obviate the necessity of extracting available roots, that the practitioner of to-day has most ample resources in the selection of any special process most suitable to his needs, out of the multitude of methods described and illustrated from time to time in the dental journals.

Without attempting a discussion of the individual or relative merits of methods heretofore presented, all of which bear a more or less striking family resemblance to each other, I shall only occupy space by a brief description of still another process which I think will commend itself for its simplicity, utility, and greatly diminished liability to accident.

The operation under consideration, when completed, will exhibit, apparently though not in fact, an entire crown of gold, and is therefore necessarily limited chiefly to the molar teeth, though it may sometimes be applied to the posterior, and in exceptional cases to the anterior bicuspids.

Presupposing that the roots to be crowned are in suitable condition for the operation, the following is briefly the mode of procedure :

All remaining portions of crown, if any, are first removed, leaving one-half a line or more of the cervical portion projecting from the gum. If decay has extended under the free margin of the gum, cut away all affected portions until a sound margin of bone is secured, being careful not to wound, if possible, the pericemental membrane. The operation I am considering is practicable even if no portion of the cervix remains, though it will be rendered easier where the neck of the tooth is unaffected. When this part of the operation is completed, take an impression of the parts, including the adjoining teeth, with some material sufficiently resistant to force back as far as possible the free margin of the gum from the remaining cervical walls. Modeling wax just plastic enough to be worked, or trial-plate gutta-percha softened in hot water, will answer the purpose. The impression secured, open into the pulp canals and enlarge sufficiently to fix therein, by any of the usual methods, connective wires or metallic pivots of sufficient strength to secure permanency and stability to the superimposed crown. These, when anchored, should be long enough to extend well into the body of the crown, and should be well roughened or barbed throughout their length. Platinum combined either with iridium or silver is perhaps best for these supports, though I have sometimes used well-tempered steel. They may be very securely fixed in the roots with oxy-chloride of zinc, or other allied hard-setting cement. It is not always necessary however to use these supports, and the operation will, whenever they can be dispensed with, be much simplified. Sufficient stability and security of attachment can often be obtained by free cone-shaped enlargements into the roots of molar teeth in cases where there is marked divergence of the roots, and ample undercutting into the body of toothbone sourrounding the opening into the palatal root. Many of my operations by the method I am describing have been performed in this way.

So much having been accomplished, the patient may be dismissed for a subsequent sitting.

From the impression previously obtained, secure a model in plaster. This will give the exact marginal outline or contour of the cervical portion of the tooth as prepared, with the length and position of the adjoining crowns. With a strip of sheet-lead about the thickness of ordinary card paper, form a band that shall not only embrace accurately the neck of the tooth as represented in the model, but conform itself with equal accuracy to the margin of the gum surrounding it, in doing which, care must be taken that the tube or box thus formed shall occupy a position in respect to direction in harmony with that of the adjoining crowns, and should be as broad, or nearly so, as the required length of the crown of replacement. The model will be a sufficient guide in all these manipulations. The leaden band may now be flattened or pressed out into its original strip form and used as a pattern in forming a similar band of gold. Taking No. 26 or 28 pure gold plate, place the lead pattern on a strip of the required size, mark the outline with a sharp-pointed instrument, and cut out the form indicated on the gold plate with shears. The softness and pliability of pure gold in the form now obtained will render its adaptation to the plaster representation of the prepared root, which it embraces, very easy with the use of pliers and burnisher. The gold band thus adjusted is completed by uniting the ends with fine gold solder.

The band being placed in position in the mouth by forcing it over the neck of the tooth, and well under the free margin of the gum, but not far enough to impinge upon the connective tissues, the patient should be directed to close the teeth to ascertain if the band is of the right width, in respect to articulation; a narrow space between its edges and the opposing teeth being necessary, as will appear hereafter.

The band or ferule is now permanently attached to the roots by the use of amalgam, which should be carefully and thoroughly packed around the metallic supports projecting from the pulp canals into the body of the crown, and also into any undercuts provided for purposes of attachment, continuing the process of packing until the tube is thoroughly well filled to a point the fourth or sixth of a line from the open end, thus leaving a narrow rim free to be turned over upon the body of the amalgam at another and final sitting. With particular instructions that the use of the teeth on that side of the mouth should be strictly avoided, the patient may be requested to return in two or three days, by which time the amalgam will be sufficiently hard for the subsequent manipulations.

The operation is completed by first turning the free edge of the gold band over upon the amalgam body, and I usually accomplish this with serrated pluggers and the mallet, the overlaping portion being well cleansed and scraped after applying the rubber dam. The serrated points used in tamping or forcing the free edge down upon the amalgam will stipple the exposed surface for cohesion with the gold to be subsequently used. A sufficient number of retaining points are now made by drilling into the body of the amalgam at suitable points. These, being carefully and compactly filled with gold foil, the process of impaction is continued until the exposed surface of amalgam is covered with a layer of sufficient thickness, and the required configuration of the masticating surface obtained, necessary to effect a practical articulation with the antagonizing tooth or teeth of the opposite jaw. It will be found that the gold used for capping will cohere readily with the overturned edges of the band, securing absolute continuity of structure—a complete box or cap of gold without seam or point.

With comparatively little labor the work of final dressing and polishing can be accomplished, and the operation is then completed by forcing the marginal portions of the cap at the gums into close contact with the cervical walls with a burnisher or other suitable instrument.

I feel warranted in claiming that there is no form of porcelain work practical in connection with this method of replacement that will compare favorably with the one just described in point of *durability*, nor do I think it is excelled in any respect in all cases where it can be employed without an offensive or objectionable exhibition of gold.

CHILDREN'S TEETH.*

BY JOHN G. HARPER, D. D. S.

Last year I commenced the subject of "Children's Teeth," and in that paper I wrote only regarding temporary teeth; this subject I will continue by taking under consideration the permanent teeth of children. One great source of decay and loss of the teeth is neglect, and this neglect is often due to the dread of pain felt by the child.

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*This paper was prepared for the Missouri Dental Association, but the writer not attending the last meeting, the paper was not read before the Association, but it was voted to have it published as part of the proceedings.

The child may have been threatened by the parents saying : "If you do not quit eating so much candy you will have the toothache and we will take you to the dentist and you will have to suffer." Often it is the case that a parent will bring to your office two or more children and while one is suffering all the rest are shocked and pained by witnessing the suffering of a brother or sister. One of my patients excused her neglect of the teeth by stating that when a small child she had accompanied a companion to a dentist's office ; the companion had a tooth extracted and my patient's remembrance of that occasion kept her away from a dentist until many of her teeth had to be sacrificed.

Dentists are often to blame for this dread, not having enough patience and tact to control and win the confidence of children, then again children are deceived by the parents and the dentist.

I make it a rule never to use a pair of forceps in extracting teeth and roots for children, unless it is unavoidable. Many times the fingers, a string or a small and innocent looking elevator is sufficient, and the child is not frightened by the formidable appearance of instruments.

Do not seat your little patient in the operating chair if avoidable, that is if the child seems to object, nearly every child enjoys a ride up or down in the chair, and it helps to amuse and secure confidence.

Among the causes of defective teeth may be mentioned an undue development of the brain and nervous system.

Children, as a rule, in cities, are placed in school too early and are urged in their studies by the ambitious parents and teachers until the physical system becomes a wreck, the teeth sharing in the general downfall.

Between the fifth and sixth years the first of the permanent teeth are erupted ; four of the most important teeth in mastication. I make it a rule to examine these teeth the first thing I do, for a child who is old enough to possess them, and draw the attention of the parents to the importance of caring for and preserving them. In case they are beyond redemption, the sooner extracted the better, then the second molar will not tip forward allowing only the distal corner of the crown to strike the occluding tooth. That dead teeth in children's mouths may be expected to last many years is proven by practice, one case is on record where a central incisor, the pulp of which was destroyed at 13 years of age, and at 40 the tooth was perfectly preserved and the color barely a tinge bluer than that of the other teeth. We should keep in mind the fact that in many instances a pulpless six-year-old molar turns out to be a more serviceable tooth than the dens sapientiæ. These four teeth (the first molars) have the chief responsibility of mastication for the growing child from the time of their eruption at about six years of age to above 12; hence their importance. The first ten years following the eruption of the first molars is apt to be a period of neglect, therefore urge upon the parents the necessity of teaching the children to properly brush the teeth and at proper occasions visit the dentist and have all necessary operations performed. The public have been educated up to the present standard in dental matters by dental practitioners, and we must keep on in this missionary work. For this purpose I keep on hand for distribution among my patients "The Teeth, Natural and Artificial" by J. W. White, M. D., D. D. S. For filling children's permanent teeth I always use gold when practicable to do so. In many cases some temporary fillings must be inserted to preserve the teeth until the child is old enough to permit the insertion of gold. Where gold cannot be used to advantage a good amalgam is the best permanent filling. In case the cavity is large, protect the tooth from thermal changes by filling as much of the cavity with cement as is practicable, then cap with gold or amalgam.

ERUPTION OF A CANINE TOOTH AT FIFTY YEARS OF AGE.

BY JOHN G. HARPER, D. D. S., ST. LOUIS.

Mrs. G.——a patient from a distance in the country called in April, 1881, to have an upper plate made. Found in the mouth a full upper rubber plate, which had become almost useless from shrinkage of the gums. Apparently the mouth was in a very good condition for the insertion of a permanent plate.

Constructed a celluloid plate using plain teeth and the articulation was such that the front teeth rested squarely on the centre of the ridge. The lower molars were missing, consequently the pressure on the upper plate in mastication was on the anterior part of the plate.

In June or July following she returned complaining of the plate, saying that her mouth was sore under it. The mouth on the right side presented a lump, which was there when I made the plate, resembling the ball of the thumb and extending from above where the right lateral had been, to the position occupied by the second bicuspid. In the anterior part of this lump could be seen a tooth, the mesial surface of what proved to be the right cuspid, which evidently had lain just back of the lateral and the first and second bicuspids.

I offered to extract, but the lady objected, and I trimmed away the surface of the plate to relieve the pressure, as the surrounding soft parts were badly inflamed.

Patient departed and returned in the fall the whole of one side of the tooth being plainly visible. Extracted with considerable difficulty and requested the patient to wait until the mouth got well and then we would see what would be required.

Returned in March, 1883, accompanied by her husband, who said that he wanted a new plate made as his wife was all the time complaining that the plate hurt her. She said that the teeth did not show enough. Examined the mouth and found that the ridge on the right side had shrunken, and shrinkage under the anterior part had proceeded so far that on the left side the anterior teeth were imbeded fully half the length ($\frac{3}{16}$ in.)in the ridge. The anterior portion of the ridge had not absorbed, but the process remained and overlaped fully the upper half of the teeth, showing that the outer half of the ridge which was not touched by the plate, had not been absorbed. The plate at the last visitation was a very good fit, showing that the absorption was uniform in front and gradually diminished toward the distal part of the mouth thus preserving the fit of the plate.

A CASE.

A little girl, nine years of age, was sent to me by her physician with the following note:

"DR. HARPER—DEAR SIR:—Please see what you can do for this little patient.

She has a scrofulous adenitis. I opened the gland at angle of jaw, as you see, and let out a lot of pus. The mother says it has never healed since, and often breaks out inside the mouth, in fact did so before it was cut, no doubt through mouth of submaxillary gland. Please see if the teeth need attending to, or any necrosis of jaw-bone. You will also perceive, by making her close the eye, that she has facial paralysis of left side, and consequently unable to close left eye. Yours in haste.

———"

I seated the unfortunate little patient in my chair, and then proceeded to examine the case. The opening was on the right jaw, and on examination I found the inferior right first molar badly decayed on mesial surface, and the pulp dead and decomposed. Examined to determine the condition of the bone, and finding no necrosis, determined to extract.

Dr. Forbes being in my office, I called his attention to the case; he agreed with me as to what should be done, and remarked that such a case had never before been brought under his observation. I extracted the tooth, and told the mother to bring the child back if the sore did not get well. That was several weeks ago, and she has not returned.

ANOTHER.

A lady called to have something done to a tooth; the filling had been removed while eating candy.

Examined the case, and found the inferior left first molar with an extensive crown filling of gold, a small portion of the lingual wall being restored by a portion of the filling. The filling had been replaced by the patient, and there was no danger of its coming out unless taffy candy should be used to pull it out of place.

Removed the filling to find that there had not been any undercut, the filling having been anchored into the pulp chamber. The upper part of the gold had broken away from that in the pulp chamber. I dried the cavity, cut out a little decay, made the margins smooth, mixed acme cement to the consistency of cream, with which I lined the cavity, and carefully replaced the gold plug. Taking everything into consideration, I think that I did the best that was possible in this case, a frail tooth in a frail patient's mouth being the principal factors to consider.

JOHN G. HARPER.

A SURGICAL DISK.

To begin the day's operations I found a young man waiting for me in the office. He was a former patient for whom I had filled one tooth and had on one occasion removed a portion of gum overlaying the inferior right third molar. His left jaw was swollen considerably and he said that it had pained him some the day before, and during the night had kept him awake; for the last five hours, he had been impatiently waiting for the time to arrive when he could call on me. I seated him and on examining his mouth found the inferior left third molar was covered on its posterior portion with gum in a swollen and inflamed condition. I placed in my engine a circular knife-edged steel disk, three-eighths of an inch in diameter, the mandrel being a little longer than the ordinary kind.

Running the engine at a rapid rate, but with gentle pressure. I cut away the overlaying gum, the patient giving no indication of being pained. The young man, as soon as he could free his mouth of blood exclaimed, "Oh what a relief!" This instrument cuts the soft yielding flesh without pushing it out of position, and requires such a small amount of pressure that the patient is hardly aware of what is going on, in fact, the operation is almost painless.

This instrument is very efficient when used to cut away any small tumors upon the body.

Any dentist who understands the tempering of steel, can in a few minutes manufacture one of these disks.

JOHN G. HARPER, D. D. S.

ROOT MODEL.

BY JOHN G. HARPER, D. D. S., ST. LOUIS.

I have recently been using the following method, in making crowns, to procure a model of the root at the point covered by the band.

Take steel wire No. 27, annealed, pass it around the root, previously prepared, twist the wire with your pliers until you have drawn the wire snug, then carefully remove and you have a ring the exact shape of the root at the point to be occupied by the band. The next step is to lay this ring on the smooth end of a block of close grained wood; with one blow of a flat-faced hammer drive the ring into the wood, carefully remove the ring and you have an exact model of the circumference of the root. Before laying aside your ring you can make it perform one more office by laying a piece of gold plate on the block of wood, lay the ring on this plate and strike the ring with your flat-faced hammer, this will cut out the cap to be soldered onto the band.

To make the band, simply bend it until it fits into the groove in the block of wood. The process of making crowns has been described so often that it is useless to relate all the steps in the process.

PLATINUM—GOLD.

This valuable combination of the best of metals should be considered indispensable in the cabinet of every progressive dentist. Only one manufacturer makes it, and the sale is slow of the small quantity he prepares. All gold fillings subject to heavy pressure or wear should be faced with platinum–gold.

A manufacturer who would make axes and edge tools with iron edges is quite on a par with the dentist who has gold alone for contouring and facing fillings on exposed surfaces. If it were possible to work it, I would prefer an iridium–gold, and hope to see some harder alloy than has yet appeared. But until then we have an alloy nearly as hard as steel in the foils, three shades, prepared by R. S. Williams, and the manner in which they use up the best pluggers ought to gratify the most fastidious.

MORRISON.

AN IMPACTED TOOTH.

An interesting case of this nature recently came under my observation. Mrs. H. aged 35, called on me complaining of a neuralgic pain in the left side of the face and head, which had continued, with slight intermission for several months. An examination revealed a superior left 3rd molar lying in a nearly horizontal position, somewhat obliquely outward to the line of the jaw with a part of its coronal surface pressing against the posterior face of the 2nd molar. One cusp of the 3rd molar appeared to be locked in the depression at the neck of the anterior tooth.

After a careful exploration it was decided not to attempt to remove the 3rd molar, which showed a well developed crown, but to extract the 2nd molar and thus open the way for the 3d to assume a normal position.

This was done, when an examination of the extracted tooth revealed the complete absorption of the posterior buccal root, together with almost the entire posterior wall of the pulp chamber of the 2d molar. Absorption had also commenced upon the posterior surface of the remaining buccal root, which was perceptibly thinned by the loss of substance.

The pulp was not yet dead, but displayed a high degree of inflammation. The source of the long persisting neuralgic pain was manifest.

C. W. S.

TAKING COLD.

It is well known that persons who are confined within doors most of the time are more liable to catch cold than are those who are habitually in the open air. The direct cause of taking cold is usually a sudden change of temperature either upon the whole or some portion of the surface of the body. Now, the chief source of animal heat being internal, our efforts should be directed towards preventing a too rapid radiation of heat from the surface of the body. To effect this our clothing should be graduated to the changes of temperature to which we are subjected. The human organism should be kept at a temperature of about 96½° of Fahrenheit, in all climates, and the body must generate heat enough, by the conversion of food, to maintain this temperature; the differences in normal temperature being quite small.

The equation of internal and external heat is an important probem, in health preservation. Hence not only should the clothing vary with climate, as well as with changes of temperature in the same climate, but we should also "establish such a habit of heat production as shall render the supply equal to all probable demands."

If one spends most of his time in a warm atmosphere and thus habitually produces but little heat, "it may happen that the stimulus of exercise will not evolve sufficient heat to resist the change of temperature which follows exposure to cold air. Such persons are "susceptible to cold" and in the absence of increased protection are liable to jeopardize health.

It is evident that the effect of sudden changes of the temperature of the body is not well understood. Dr. O. Lassus, of Berlin, conducted a course of experiments upon animals with a view of solving this difficult problem. Rabbits shorn of their hair were taken from hot rooms and plunged into ice-cold baths. On returning the animals to a warm atmosphere they apparently recovered their former condition and *seemed to be* perfectly restored. Yet sharp attacks of diarrhœa frequently occurred, and "*after the lapse of one or two days*" there occurs "albuminuria, which is at first slight, often is in high degree, and the urine becomes relatively scant, and contains *hyaline casts.*" The temperature of the rectum rises several degrees above the normal standard and the albuminuria continues several days. "But sometimes it continues for weeks, even months, even up to death of the animal."

Post-mortem microscopic examinations showed the existence of "intestitial inflammations" of the kidney, liver, heart, lungs and nerve sheaths, while the skin remained unaffected. The author's explanation of these phenomena is that already furnished by Rosenthal, viz: "That the blood suddenly cooled at the periphery is driven into the internal organs and here acts as an excitor of inflammations." C. W. S.

DENTAL SOCIETIES.

ST. LOUIS DENTAL SOCIETY.

Regular monthly meeting.

Besides the members of the Society, the students of the Missouri Dental College were present by invitation. This being the meeting for the installation of officers for the ensuing year, the president called upon Drs. Spalding and Eames to escort the president-elect; Dr. J. B. Newby, to the chair. On taking the chair Dr. Newby made a few pertinent remarks acknowledging the high honor conferred upon him by the members of Society and took the chair as presiding officer.

The retiring president, Dr. J. G. Harper made a very neat and appropriate address which was received with the highest evidence of appreciation by the gentlemen present. It was as follows.

Gentlemen.—In retiring from the position of president of the St. Louis Dental Society I wish to thank you for the honor you have seen fit to bestow on me, and to thank you for the uniform respect you have shown to me as your presiding officer. I shall recall the year that I have just passed with you with pleasure, and shall endeavor at all times to conduct my professional life in such a manner that you may never regret having bestowed the greatest honor in your gift upon your humble servant. The first half of the past year was one of unusual interest in this society; that the latter half was not up to the same standard was not the fault of the officers. If members will not fulfill their duties they are to blame and not the officers who have at all times endeavered to procure papers for each and every meeting. I hope that the president who has just taken his seat may be fortunate enough to secure for each meeting an original paper for us to listen to and then discuss.

It seems to me that the members should be required to do something more to retain their names on the roll, than simply to pay dues. Every member should give us a paper once in two years at least, and no member should be eligible to the office of president until he had given at least one paper or had filled the office of secretary one year. I think that a programme covering one or two years would do much to keep up interest in our meetings. It is difficult to select a subject and write an article upon it, but if we would select a subject and then appoint the most suitable person to take it, we would have a paper that the author and those who might be so fortunate as to hear or read it, would be proud of.

In proof of my assertion that a programme would bring forth papers, I cite you to the work done during the first seven months in the year 1879. We had a programme covering that period, containing twelve subjects, and out of that number only three failed, thus giving us nine papers in seven months. That year we held meetings twice a month, giving less time in which to prepare papers than now when the meetings are monthly. We now have a dental journal in which we can publish our papers and the discussions thereon. This should be an incentive to renewed interest in our society as our light need not be hid, but be made to illuminate the whole dental profession. We owe to the dental profession and to the world the results of our observations and experiences. Very few of us fulfill this duty. We read, study, and store our minds with knowledge and apply it ; but there most of us stop. We profit by the labors of other minds and give no equivalent in return.

If the members of this society would adopt the habit of keeping case books and dot down their observations of interesting cases, which are of daily occurrence with many of us, and bring them to the society, we would always have proceedings that the dental journals would be glad to publish. Let each member determine to do something for himself, the St. Louis Dental Society, and the profession at large, and make the year 1884 one of unusual interest.

After the address, Dr. C. W. Spalding gave a very instructive lecture on the Tongue and the special senses of Taste and Smell.

In the course of the lecture, Dr. S., said, that the text-books on physiology, usually assert that the sense of taste is excited by the actual contact of the sapid substances of food with the terminal filaments of the gustatory nerves. He had for years questioned this assertion—had in fact rejected it; and could see no reason why the conscious perception of the sense of taste, as well as that of smell, should be caused in a different way from that of sight and sound. He said the filaments or the nerves conveying the senses under consideration terminate in the substance of the mucous membrane, *beneath* the epithelial layer. Consequently if the substances to be tasted, or smelled, came into contact with the terminal nerve filaments, they must first pass through the epithelial covering. This would scarcely accord with the instant perception which follows contact of substances with the mucous membrane of either the nose or tongue.

Upon the conclusion of Dr. Spalding's address, Dr. W. H. Eames said that he agreed with the speaker in his view of the manner in which the sense of taste was conveyed and asked Dr. S., if there was not an organ by which this sense was transmitted to the nerve filaments of the gustatory nerves.

Dr. Spalding replied, that he believed there were such organs, but he had not seen a description of them, and asked Dr. Eames to describe them.

Dr. Eames responded by giving the following description of these newly discovered organs:

At the request of Dr. Spalding, Dr. Eames gave the following brief synopsis of Thos. W. Engelmann's article on the organs of taste. *Stricker Page 777.*

Chas. Lovén and G. Schwalb discovered independently of each other, in the laminated pavement, ephithelium which clothes the papillæ circumvallate in the tongue of mammals, numerous small microscopic, bud-like groups of cells, which stood with their ends upon the twigs of nervus glosso-pharyngeus; Lovén called them Taste-buds or bulbs, while Schwalb termed them *Taste-beakers*

The taste-buds occupy cavities in the epithelium of the mucous membrane of the tongue and fit them perfectly at every point. The shape of these cavities resembles a flask with rounded belly. The bottom of the flask rests upon the connective tissue surface of the mucosa. The slender and generally short-neck of the flask, pierces the horny layer of the epithelium and terminates at the surface with a rounded opening—*taste-pore.*

The longitudinal diameter of the taste-bud always exceeds the greatest transverse diameter and varies in man 0.077 to 0.081 mm. The greatest transverse diameter is about 0.0396 mm. The width of the taste-pore, is from 0.0027 to 0.0045 mm (*Schwalb*). The taste-buds differ a little in form in the different animals. In some (ox, pig) they are slender, their length being almost three times as great as their breadth; while in others (rabbit, roe) they are more compact, the length exceeding but little the breadth. The most slender, moreover, are usually the largest. The size, also, varies somewhat. In the mucous membrane of the tongue, the chief places where the taste-buds lie, are the lateral slopes of the papillæ circumvallate. Here they form a broad girdle around the papillæ, to the number, sometimes of several hundred. They are also found, though not so often, and then only in solitary examples, in the papillæ fungiformés. In the rabbit and hare, moreover, there exists at the root of the tongue, on both sides, a large oval prominence which is subdivided by some ten to fourteen, deep, parallel transverse furrows into narrow ridges (taste-ridges) that conceal thousands of taste-buds. Taste-buds occur always in parts of the mucous membrane of the tongue which are particularly protected, *i. e.*, in furrows and at the bottom of crevices. Thus for instance, in the papillæ circumvallate, they are never to be found in the epithelium of the plateau, but in the lateral slopes of the papillæ, which are protected by the surrounding circular wall; the same is true of the lateral organs of taste in the rabbit and hare, where the buds never occur along the summit of the ridges, but always in their sloping sides. The walls of these flask-shaped spaces occupied by the taste-buds, are composed by epithelial cells, except the bottom which rests on the mucous membrane. The taste-bulbs consist of a number of long, thin cells arranged in a similar manner to the leaves of a bud. These cover-cells are long, spindle-shaped elements, containing an elipsoidal nucleus near the center. The central cells seem to be more highly organized than the external ones and are to be regarded as the true taste-cells, and are probably connected with the nerve-fibers which terminate beneath the epithelium around the sides of the papillæ. The central or taste-cells are long, thin, homogenous elements consisting of an elipsoidal body, which is prolonged at its upper pole into a tolerably broad; at its lower pole into one or more narrow processes. Schwalb distinguishes, in man and the sheep, two kinds of taste-cells, *Needle-cells* and *Staff-cells.* The needle-cells are the most numerous, and the upper pole terminates in a brilliant, blunt needle point. While in the staff-cells the terminal point is short and broad without the needle.

Concerning the connection between the nerve-fibers and the elements of the taste-bulbs little is known. It is known that small branches of nerve glosso-pharygeus, consisting chiefly of slender medulated fibers, containing small groups of ganglion cells proceed towards the circumvallate papillæ and ramify throughout their substance. Just before entering the base of the papillæ, they form a plexus, from this plexus one or more bundles penetrate, centrally the papillæ, when they subdivide into fine intertwining twigs, containing more of the pale than the darkly outlined fibers, which radiate toward the epithelium, in which the taste-buds lie. The delicate, pale, terminal fibers resemble very strongly the processes of the taste-cells. It is highly probable that these finest fibrils are continuous with the central processes of the taste-cells.

The parallel *taste-ridges* on the base of the tongue of the rabbit and hare, with their thousands of taste-bulbs, seems to account for the fact alluded to by Dr. Spalding, viz.; that the sense of taste is greater in animals than man.

Dr. Eames offered the following resolution,

"*Resolved*, That no member of this society shall be be eligible to election as an officer of this Society who is in arrears for dues to the Society, or who has not offered a paper to the Society during the past year."

Seconded and carried by a vote of the Society.

Dr. Harper, offered the following resolution which was adopted.

" *Resolved,*' That the executive committee be requested to prepare a programme of papers to be presented before the Society during the ensuing year."

Dr. W. F. Hermann proposed the name of Dr. B. Staudinger for membership in this Society which was referred under the rules, to the committee on " Ethics and Elections."

On motion the Society adjourned.

JAMES W. WHIPPLE,
Recording Secretary.

REPORTED LIST OF REGISTERED DENTISTS in the city of St. Louis, alphabetically arrranged:

Bass, I. A.
Brackett, S. J.
Brecht, J. E.

Case, J.
Campbell, J.
Campbell, W. G.
Canine, R. H.
Chase, H. S.
Chase, E. C.
Conrad, W. N.

Eames, W. H.
Ehmann, E.
Eisemann, A. H.

Ferguson, J. G.
Fischer, J. A.
Fisher, Henry
Flickinger, Adam
Failler, A. H.

Grimes, F. T.

Harper, J. G.
Haskell, J. N.*
Hermann, W. F.
Howard, J.
Holmes, G. P.
Holcombe, W. H.
Houston, C. F.

Jacob, D.
Jacob, S.
Jocelyn, C. W.
Jocelyn, D. I.
Johnson, E. V.

Keck, C. E.
Kavanaugh, M.

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*Deceased.

Marshall, J. M.
Mayer, C.
McNamara, J. T.
McNamara, C. F.
Newby, J. B.
Park, Edgar
Prosser, A. J.
Rickard, D. H.
Robitoy, G.
Sanders, R. T.
Scott, W. H.
Spalding, C. W.
Taylor, F. T.
Ulman, E. S.
Wear, R. A.
Whipple, J. W.
Wick, J. W.
McNamara, M. C.
Morrison, W. N.
Murray, A.
Muth, W. E.
Newington, H.
Prince, L. F.
Roemmick, J. P.
Spalding, J. H.
Staudinger, B.
Stevens, M.
Tolhurst, G. W.
Utt, G. G.
Wickersham, W. H.
Wickersham, W. R.

All persons practicing dentistry in the city of St. Louis, whose names are not in the above list, are doing so in violation of law, and are liable under its provisions.

SELECTIONS.

ORAL SURGERY.

BY DR. HAMILTON, COLUMBUS, OHIO.

Gentlemen.—I supposed I was to meet a couple of dozen dentists and to take up a topic common to your profession and mine. I received your invitation last night, and accepted it, and although I have not passed a thought upon this branch of surgery in which I have had much experience, I will probably be able to sufficiently occupy the time allotted.

I call your attention to the surgery of the jaws—not the teeth, and it will be impossible to more than touch upon the subject. It is only a short time since surgery invaded the jaws to any considerable extent. Minor operations had been performed, but it was only a couple of generations back that these bones were operated upon extensively. The time has come when everything between that which you do, and a complete extirpation of the entire bone is effected. I show you, as exemplifying the remark, this specimen. It is an inferior maxillary bone. Both of the condyloid processes are there, and the entire bone between, and with it a tumor that weighs two pounds and a half. It was removed from a gentleman in West Virginia, successfully as far as the removal was concerned, unsuccessful in that my patient died.

We have here a skull in pieces. You are familiar with what constitutes the superior maxilla, but it will not be out of place to inquire what constitutes its removal. I have here the antrum laid open and shown very nicely. The division is a little to the left of the median line. This section is where we make it in removing the superior maxilla. The incision, when the part is in a normal condition, is not the extensive thing you would encounter when you come to look at a specimen like this. This exemplifies a case that requires the removal of the superior maxillary bone, and might be a mild case. It is not as large as some. I have another preparation that shows an exaggerated case. It is another immense tumor that weighs two pounds. It rises as high as the nose, closes an eye, fills the mouth, and projects the right side of the face very extensively. In one case I had even an exaggeration of this in many respects. It protruded from the mouth more and lifted up the eye until it rested against the superior orbital ridge. Looking at this preparation the removal of such a growth would seem a very formidable thing, and it is. We removed the superior maxilla two or three weeks ago. I announced to my class that it was a most promising case of the kind. Although it was not a grave case in some of its aspects, it proved to be very bloody. A dozen arteries were spurting their contents at the same time. After we removed the tumor we found it necessary to tie but one artery. Although the hemorrhage seemed formidable it proved a very feasible procedure, the wound healing in a very few days. In such a case how are we to work? How are we to distinguish a case in which we *can* operate, one in which it will *pay* to operate, from one in which it will not? Before I performed this operation I saw a tumor very much worse than this, in which case I decided that an operation would not pay. I declined to operate, and soon after I operated on another case in which the tumor seemed quite formidable. In four months it had attained these proportions. The ability to remove it was not questioned, but it had developed within a period of six months to a large growth, involving all the surrounding parts. The fact that it came within that time put it among malignant growths, and I would do harm rather than good by attempting its removal. In the case in which I operated, my patient had had a growth of seventeen or eighteen years; finally coming to occupy the mouth, press up the floor of the orbit, and be a large tumor, though not near as large as some I have removed. The question of malignancy is of prime importance. In these rapid cases by no means operate. A malignant growth of very rapid development will be fatal if it attains this growth, developing in connection with the superior maxillary bone, destroying other bones about it, all within six months. The removal would amount to nothing. It might do something for the reputation of the surgeon, but no good to the patient. A growth that begins within the antrum, and growing slowly, presses its walls apart, and finally, perhaps, causes absorption of them—once removed will not return again, and is attended with the very best results.

I have here a growth of that kind in a quart cup. When put in it filled it. Full strength alcohol has been on it twenty years, and it has contracted, but it is an immense growth to develope from the antrum. The case has a remarkable history. It occured in Muskingum township, Muskingum county, Ohio. The tumor got to be of immense size, projecting from the boy's mouth, forcing the eye from the orbit to a considerable extent, and filling so much of the mouth that the only way of eating was to get his food between the teeth and cheek on the left side, and back to where the posterior molars were absent and so into the posterior part of the mouth. The back part of the mouth was also occupied by this growth. A boy of fourteen years having such a tumor would be a monster in appearance. He consulted the leading surgeons in this country and Europe.

That tumor is immense; it is striking in some of its aspects that relate more particularly to its anatomy. That was generally decided to be a post-maxilliary tumor. It was believed to have developed behind the antrum, and pressing outward through the pterygoid-maxillary fissure into the temporal fosse, and at the same time involving the superior maxillary bone, become very prominent in front. The surgeons advised that it be left alone. Leading surgeons in this country and Europe advised that course, believing its removal not practicable. Many operations of that kind had been performed, but without exception the patients died. The case finally came back to Zanesville to die. It came under the care of Dr. Hildreth. The Doctor referred the case to me. I made an examination. I asked him to stay and let me decide what to do. I made frequent examinations, and concluded it had developed in the antrum ; that it was not a post-maxillary ; that in developing it had caused absorption of the posterior as well as the anterior wall, and had developed very largely backward and outward. That made a difference as to the possibility of removing it ; I came to the conclusion to remove it. I spent six weeks on that case, and the boy visited me once every day or two. I believed almost from the first that it could be removed, but so many eminent men had passed on it unfavorably that a young man thirty-three years of age would be slow to take on himself so formidable a procedure. During this six weeks I made arrangements to remove it. The "Sons of Malta" agreed to use some funds for defraying the expenses of the operation. I arranged to do it at my regular clinic, in a room holding seven hundred persons, and that room was packed. It was under those circumstances I had to operate. Prof. Blackman, of Cincinnati, had examined it, and decided it could not be removed. In two weeks the patient went home. He is alive to-day and well. I wish these pictures were large enough to give an idea of the case.

A Member.—About what age is he now.

Dr. Hamilton.—He is forty. The operation was when he was fourteen.

Dr. Herriot.—I was engaged with Dr. Hildreth at the time the boy was sent to Columbus. I saw the boy ten years after the operation. At that time he was a man grown, in perfect health. No "word-painting" can give the slightest conception of the deformity before the operation.

Dr. Hamilton. And the picture fails ; it is not so striking as the case itself. It would require half a dozen pictures to give anything like the appearance of the boy. I did just what others do in performing the operation. It was not only immensely large, but my patient was very small—a boy of fourteen, and slender. I began by an incision near the corner of the eye, cut down perpendicularly by the side of the nose ; cut around its right wing ; thence to the middle line—cut down firmly, or so far as possible to the bone. I began another incision from the middle of the zygoma, cut down in a sweeping direction to the corner of the mouth; then dissected up the skin. When I came to separate this it was so thin it seemed to me it would slough. Of course, the object of the operation was to remove the tumor, and I was separating from the tumor that which did not belong to it. I found nearly everything belonged to it. My flaps were just as thin as could be—a great flap like an apron. I then divided the zygoma. That was easily done. I sawed a notch and cut it in two with bone pliers. The next step was an incision through the orbital process. I sawed part way through that, and with bone pliers separated it. Then everything was clear in the direction of the nose. I passed a bone pliers into his nostril, cut the nasal process from near the corner of the eye into the cavity of the nostril, and only the hard palate remained. I sawed through the alveolus on to the hard palate, and taking strong forceps cut that. Now I could shake it in every direction. The bony parts were separated. I hoped at that point to remove it, but the attachments were such I couid not do it. I was left to my own resources, I had followed the books. They gave me assurance that when I had divided these bones, I could turn it out, perhaps with large forceps; and then reaching behind separate the soft palate, and my work would be done. I could not stir it at all. I cut out a large mass of it; found I had not all of it. and cut another mass, and in that way dissected it out. It took an hour and fifteen minutes.

The apron of skin hanging down was very thin and apparently bloodless. I put in quite a number of stitches, put a mass of lint inside to keep it in place, took him to bed, put on warm dressings of lint. I saw him every two hours; at bed time I saw him, and at that time I lifted off the dressings to see what condition this apron was in; it had not sloughed. Next morning lifted the dressings and it was not dead but was thickening up a little. In a day or two it had so thickened that it was not an apron, but was simply a flap large enough to cover the cavity. It united, and in two weeks I met the patient on his way to the depot, walking; he went to the nearest railroad station, a mile and a half perhaps, from his father's house, and walked home. It involved the removal of the entire superior maxillary bone.

Now I show you two tumors. the history of which is striking and interesting. The case occurred in the practice of Dr. Hammel, of Newark. It was a fibrous polypus, and plugged up one nostril. The Doctor passed a wire around it, tightening it daily, and after three or four days it separated with extensive hemorrhage. After a few months it returned. He then sent the patient to me. I sent a letter to him stating it to be a fibrous polypus ; it grew still larger the man was having formidable hemorrhages ; he sent him to me to operate ; I made the same operation he had. The tumor hung back into the pharynx, and was large ; I passed my wire through the nostril, and looped it over, and tightened it in front ; I tightened it a little more every day or two. I have said wire ; I did not use wire, I used strong whip cord. About the fourth or fifth day it came away ; it was as large as a hen's egg. I supposed I was successful. As much as six months afterward, perhaps, the right nostril was plugged again, the tumor also appearing in the pharynx. He waited for some time ; he returned, and I found a tumor projecting behind the maxillary bone and onto the side of his head through the pterygo-maxillary fissure. It had forced its way from the pharnyx, and was developing on the side of the head. Profuse hemorrhages had occurred, and something must be done. Such operations had never been successful. It was a post-maxillary fibroid. The maxillary bone was pressed forward. It was healthy, but the tumor was behind it so we could not reach it except by removing the superior maxilla with an uncertain prospect. Finally it was done at my clinic again, and I am sorry to say it was not successful, the patient died.

Second case : I removed the superior maxillary bone as in the other case ; here everything was firmer. It makes an immense chasm, but these tumors are then accessible. I found them attached at the bottom of the sphenoid bone. I had no difficulty. Lifting one up, I followed down the pedicel with my finger, and tore it out. That tore open the sphenoid cells and nearly exposed the brain : fortunately it was not deep enough. After tearing open the cells and making a complete separation, I was sure of success so far as the removal was concerned. Here is a point to be very particular about. I said that no patient ever recovered from this operation ; it involves a shock that had always been fatal. I want you to bear in mind, my patient reacted within twenty hours. His appearance and temperature were good ; he was comparatively comfortable ; that was Sunday morning ; on Sunday he was comfortable ; through Sunday night he took nourishment and was quiet; Monday and through Monday night doing well; Tuesday morning he was out of danger; saw him through the day and he seemed perfectly well; next morning I got a message saying, "Come quickly." He had had a pain in the heart and died within an hour or two. Any surgeon would conclude that, so far as the shock was concerned, that man recovered. There was as good recovery up to that time as I could desire. Suddenly a pain in the heart with great difficulty of breathing and a blue condition of the surface. A clot of blood had lodged in the cavity of the heart, stopped its action, and killed him. That man died from an accident. That operation, so far as the shock is concerned, was more successful than the other, because he reacted quicker. If I meet another case I shall not be deterred from an operation until after the patient gets in that extreme condition. He was having hemorrhages every few days or weeks; they ran to the very verge of life. There was no hope except in the operation. I, in good faith undertook to save life; I failed, not from the shock, but from a heart clot.

Dr. Rehwinkel.—Was the shock very severe, and the circulation disturbed during the early hours after the operation, which would account for the paroxysm?

Dr. Hamilton.—It was severe but not protracted; I have no doubt he recovered from the shock. Gentlemen, these are grave operations. I have a more marked specimen of post-pharyngeal tumors here, taken from the last case. This failure will not deter me from operating again, thinking as I do he died from heart clot.

A member.—Do you believe if he had the vitality the boy had he could have recovered?

Dr. Hamilton.—He had great vitality, nerve, vigor, and courage and self-reliance. When a clot floats into the heart and remains there, the patient must die soon.

Dr. Watt.—What valve in the heart was that in?

Dr. Hamilton.—I don't know. There was no sign of trouble until after midnight.

A member.—Were these patients under the influence of anæsthetics?

Dr. Hamilton.—We aim to have them, but it is very difficult. That was shown especially in our last operation. We sought to get a large amount of ether into him. Our plan was to give it to him slowly, let him breathe deeply for a long time so as to get his system thoroughly charged ; not to give it rapidly and get him under the influence that way, because the effect would be transient. We hoped to get him well charged, and that it would last, but at a certain stage of our operation the pain returned, and he was out from under the influence. He suffered terribly. In that respect it was a failure ; we did not give the patient as much ether as we wished. To give ether after a certain stage in the operation would be death. I owe an apology for occupying so much of your time. Gentlemen, I am very much obliged to you for your attention. (Applause).

Dr. Butler offered a resolution tendering Professor Hamilton a vote of thanks for his interesting lecture, which was adopted.

Dr. Rehwinkel.—Mr. President— In relation to the remarks of Dr. Hamilton the Society may consider this a great treat, because Professor Hamilton has told us a great many things on which the books are silent ; and a great many points were brought out by the Professor's remarks. It is only by relating and illustrating practical and formidable operations that information is conveyed, which, from some cause or other, scarcely ever gets into any written article. Little points are brought out by questions, and the attention is called to little things which may be too insignificant for an author to think worth expressing in writing, which to other minds seem of great importance, and hence it is that a lecture, with questions answered, is more satisfactory than the best written article. One who has witnessed operations on the maxilla knows the formidable character of them. I have seen many students made very sick when they first witnessed operations of this kind. It is an operation that tries the nerves of experienced practitioners, and the Professor has very graphically described it. His anxiety in regard to the thinness of the flap I can very well comprehend. Owing to the improbability that there would be enough circulation carried through the tissues to keep vitality, and the consequent fear of sloughing. All who have had an opportunity of witnessing operations of that kind, when tumors have pressed upon hard parts and thinned the tissue by absorption, would understand it, and therefore the relating of these cases was exceedingly interesting.

Dr. Pooley: Mr. President—I have been certainly as much interested as anybody present, in the lecture to which we have listened. There are three things that would create astonishment in the mind of any one who should witness one of these operations for the first time. First, at the boldness that would undertake and at first advise such enormous mutilations of the human face; second, the wonder that the patient did not die on the table; and third, if he followed the case at all, the still greater wonder at the marvelous rapidity and completeness with which nature effects a cure after these formidable mutilations. Dangers surround the patient from the moment that the operation is begun until at least a week has passed away. Dangers surround him every instant upon the operating table. One of them, of course, is from hemorrhage, (I mean death from loss of blood,) and salvation from this depends often upon the self-reliance and rapidity and boldness of the surgeon. There is no time to adopt temporary expedients—to send out for new appliances to replace anything that may have been neglected or forgotten. You are in "knee deep," and the more quickly you get through the more safety to your patient. There is another thing connected with the bleeding which was not alluded to in the lecture, but which has cost many lives; that is, after the separation of the bony parts of the tumor, the rapid pouring of the blood into the larynx, and air passages, thus suffocating the patient almost instantaneously. This is, indeed, the principle danger that surrounds the operation itself. It has cost more lives on the operating table than all other contingencies put together. To obviate it a variety of suggestions have been made; and it has occupied and is now occupying more of the attention of surgeons who perform these operations than any other point connected therewith. Many surgeons, principally the Germans, always perform a preliminary tracheotomy, so that they may have not only an opportunity of setting up artificial respiration and preventing blood entering the larynx, but also have a channel to keep up the administration of the ether, as during the operation it is almost impossible to administer it by the natural air passages. Some persons, after making a preliminary tracheotomy, introduce a plug of sponge in the larynx, and allow it to remain during the whole operation. Van Trenlenberg, a German surgeon, has modified this sponge plug by introducing a rubber tube into the larynx. This is so inflated as to completely fill the interior cavity of the larynx, and thus prevent the hemorrhage from entering the air passages, and put them under the control of the operator for the purpose of etherizing. These processes have not fonnd favor in this country. I do not know whether they have been practiced more than a very few times here; neither have they found favor with English or Scotch surgeons. To obviate the danger of blood entering the larynx, we rely upon the reversal of the position of the patient; and I should consider it as important always, before undertaking an operation of this sort, to have a table with leaves and hinges so arranged that, at a moment's notice the patient's head could be made considerably lower than the rest of the body, so that the blood, instead of running down through the larynx into the air passages, could run safely out onto the floor. Many surgeons, particularly Annandale of Edinburg, insist on this from the beginning to the end of the operation, and do, in fact, operate upon their patients almost upside down.

It is astonishing, as I have already said, how nature repairs these wonderful gaps, and what little deformity remains. The incisions that are made for these operations have been carefully studied as to their cosmetic results, that is the reason they are carried in their natural folds. Too many stitches cannot be put in. Sew them as neatly as a tailor, and some of the stitches may be taken out in a few hours after the operation.

With regard to the management of ether, it is ordinarily aimed at to give the patient enough to banish pain, but at the same time not to abolish reflex sensibility, not to produce the profoundest anæsthesia. If this happy medium can be hit upon, the patient will not suffer pain, but there will be enough reflex sensibility about the larynx, for him to cough out any blood he may swallow, unless it should pour in in very large quantity.

These cases of post-pharangeal fibroids or polypii, as they are sometimes called, have been reached over and over again by the removal of the maxillary bone and also without the removal of the maxillary bone, by making the same incisions as for the maxillary bone—sawing along the upper margin of that bone and then rocking it until loosened and broken away from its attachments, bending it downward and reaching behind the bone and cutting off, or scraping off the base of the tumor attached to the pterygoid, or basilar process of the occipital bone itself, replacing the upper jaw, sewing up the soft parts, and thus saving the bone, and just as thoroughly extirpating the tumor as if the bone itself had been removed. This has been done among others in New York by Henry B. Sands. These are some of the points that occur in this field of surgery. You will excuse me for alluding to them. These are about the only things that were omitted in the very exhaustive and interesting talk we have enjoyed listening to this afternoon. (Applause.)

A Member: I would like to ask Dr. Pooley what he ordinarily uses as an anæsthetic?

Dr. Pooley: Ether ordinarily for protracted operations, and chloroform in the short operations, and also for children. I never mix them. I detest mixed drinks on principles.

A Member: In the use of anæsthetics, which interrupts the healing by "first intention" more than the other, if either?

Dr. Pooley: I don't think eithei of them has anything to do with it.

Dr. Watt: I was struck with the difficulty, in such operations, of keeping up the action of anæsthetics. I would like to know whether it is ever considered practicable in tedious operations to rely on alcohol as an anæsthetic. Long ago I assisted in two very tedious operations in which the patient in each case was profoundly unconscious, and showed no sign of pain, and had not even a dreamy memory of the operations, and yet each patient was absolutely dead drunk, and one of them remained so nearly an hour after the operation, and made a complete recovery. That patient was somewhat in the habit of using alcohol; not to excess. He was not a drunkard, but it was known how alcohol acted on his system. The other was a young person, and nothing known about his habits, but both patients were dead drunk. I was a spectator at one of the operations, and an assistant at the other, and both were highly satisfactory to the surgeon in charge, as to the anæsthetic influence. Now, my own opinion is that alcohol is too dangerous an anæsthetic in that condition; that it would add to the dangers of anæsthesia; but judging from those two instances, I would be favorably impressed with .the prolongation of the anæsthetic condition by its use. One of those cases occured thirty years ago.

Dr. Siddall: Was any anæsthetic used aside from alcohol?

Dr. Watt: Nothing but alcohol. That was before it was known that ether could be used as an anæsthetic. It was in 1845 or '46. The operation occupied about an hour and a quarter, and the man was unconscious through the influence of French brandy until the operation was over, and waked up perfectly satisfied, and inquired if they were going to begin the operation, or postpone it again. That was his first inquiry.

Dr. Herriott: Mr. President—During my practice at Zanesville with Dr. Hildreth, we adopted this plan; first, giving clear whisky, almost producing drunkenness, then removing the teeth, the most severe part of the operation, when there was only a small amount of diseased bone to be removed. Then giving ether or chloroform, generally ether, when the rest of the operation was performed. Our surgeons in Indianapolis, Dr. Marsee, and that type of men are now resorting to alcohol as an anæsthetic; the alcohol first and ether afterwards. Taking the alcohol into the stomach and the ether into the lungs.

Dr. Hamilton: I think anæsthesia ought to be used commonly in dentistry, not full anæsthesia, but minor anæsthesia would help your patients, and facilitate your work, and be very pleasant. There is a way of giving ether that will cause pleasant exhileration. There will be no vomiting nor pain, and I do not think there is danger. First explain that this cannot hurt him; tell him "you can have pain or not, just as you choose." Take a little ether—Squibb's is best—put on a napkin, and have him take a few moderate inhalations; then tell him to breathe deeply, a second and a third time; when he has taken three or four inspirations, you can take out teeth without impairing consciousness or producing pain, and you may do this almost every time in a minute and a half. If you are decided and understand it, you will succeed in nineteen cases out of twenty. In one case out of twenty the patient will fight and you will not succeed. Have the patient raise the hand and take an inspiration, a second or third time, and breathe deeply, and if the hand drops then go ahead. If they take four or five of these forcible inspirations, you can go ahead whether they drop their hand or not. Eight years ago I had used anæsthetics about five thousand times. I have never seen a death from it. I use it five times a day frequently. I have used it seven or eight thousand times. My estimate of the hazard attending the use of ether is, that it ought to be used in extracting every tooth. The danger attending these *grave* operations is very serious, from hemorrhage especially. In my last operation our patient was bleeding terrifically. I had removed the jaw, the blood was flooding the patient. I was doing what I could in getting rid of it. A young dentist ran his hand down the throat and brought back more blood than I could have done in a dozen spongings; and I think if we were all up to that sort of thing, as the young dentist was, we would get our patients through with much less peril than we do.—*Trans. Ohio Dental Society.*

[The remainder of the discussion is interesting but too voluminous for our space.—Eds.]

JOURNALISTIC.

“Reading maketh a full man; conference, a ready man; and writing, an exact man.”

The Scientific Method in Dentistry, by Dr. Jesse C. Greene, in the *Dental Cosmos* for December:

In the first article he says: “It is not what we know, but how to know, not what we think, but how to think; not my opinion, but that which gives me a right to hold an opinion—these things I ask you to consider with me.” Every man I meet is my master in some point, and in that I learn of him, “says Emerson:” * * * “We find it difficult to observe a simple phenomenon to record faithfully a single fact, to acknowledge openly an error.” * * * It has been well said, that he who sees most and can best tell what he sees, is the greatest man.”

We need more of “The power of arranging, combining, discerning,digesting the masses we learn into learning.”

“Science is methodized thought, classified truth, the reduction of knowledge to its lowest terms.” * * * “Among uncultivated observers, the tendency to remark favorable, and forget unfavorable events, is so great that no reliance is to be placed on their supposed observations.”

“Bacon says ‘men mark when they hit and never mark when they miss.’ ” * * * “Finally, a conscientious regard for this Scientific method will sharpen our sight, quicken our perceptions, sweeten our tempers, make us more exact, more truthful, more swift to hear, more slow to speak; above all, it will prove us to be reasoning creatures by making us in all things, at all times, and towards all men, more reasonable. Thus shall we disarm prejudice, correct hasty criticism, prune exaggerations, eliminate error, silence bickerings, challenge sciolisms, and, sacrificing personal ambitions, deal with facts, rather than with men. Thus, too, shall the application of science in dentistry contribute toward the better and fuller establishment of it as a science as well as a practice."

Dr. J. L. Williams considers the merits and claims of artificial crown—and bridge—work; he makes his statements upon the experience which he had gained by giving this work his almost exclusive attention for the past year, rather a short time in which to test the practibility of such practice, a fact which he admits.

He gives his method of destroying the pulps in any of the sixteen anterior teeth, thus: "Place the blades of a pair of excising forceps in groves, previously made at the margins of the gums, a little to one side of the center and with a quick dexterous closure cut off what remains of the crown. This will usually leave the pulp exposed at the point of its broadest diameter. An orange-wood point, which has been previously prepared as nearly as possible to correspond in size and shape with the pulp, is inserted into the canal beside it, and with one blow of the mallet is driven to the extremity of the root.

The remains of the pulp will usually adhere to the wood on its withdrawal. If not, it can easily be removed with a barbed broach."

He says that if skillfully done it causes little or no pain— * * "*it should be plugged at once.*"

He plugs the root with carbolized orange-wood, which he considers the best root filling he can use. The article will be continued in January number.

Dr. Atkinson discourses upon Alveolar Abcess, he gives the definition of an abcess as a cell, pocket, or chasm in the flesh. * * * "In strumous habits of body, the molecular changes are slow, and the abcesses are called *cold* abcesses.

In better organizations they are very likely to assume an inflammatory character, and are known as *acute* abcesses." * * * "When the resistance is equal on all sides of the abscess a tendency known as metastasis transfers the molecular disturbance to a more favorable locality, holding strong bonds of sympathy with the territory first invaded. This is called *translation* of the abscess, and has given rise to what is denominated counter-irritation to cure these aberrations of nutrition." * * * "Hot or cold applications appease or aggravate the pain where the pulp is involved, and thus differentiate pulpitis from pericementitis." * * * Zinc chloride, twenty grains to the ounce of water, with which to bathe

the part after the operation of removing the dead tissue, promotes union by first intention." * * * "When should extraction for alveolar abscess be practiced, and why? When the pericementum is entirely dead, or so debilitated as to render a return to health doubtful. Never, if from dead pulp without pericemental destruction." "I am asked to give the reasons for my preference of the remedy I commend.

It is based upon the capability the zinc has of coagulating the protoplasmic fluid escaping from the wounded tissues to that degree which best favors the generation of embryonal corpuscles from which the new tissues are produced.

Dr. E. H. Best discusses a new dental amalgam, says: "Though not so pretty as gold, amalgam can be used in teeth too frail for that material, and though in disadvantageous contrast to the oxyphosphates, by reason of its failure to preserve its color, yet it endures attrition so much better than the phosphates, that its preference is in a measure, obligatory." * * *

He considers heat injurious to alloys, of the kind under consideration, therefore he uses electrolysis in their preparation. "The compound he recommends, he says, has now been practically in use and under observation for some years, and he has never seen a case of failure or of discoloration, through its agency. When used without removing surplus mercury, a little of which is provided, for greater ease and convenience of manipulation, and to have the mass of required consistence, it is found to adhere to the walls of the cavity like cement. It is the only amalgam known that will adhere to a burnisher while in its soft state, permitting that instrument to be used to convey it to the cavity."

"When it is intended to be used on grinding surfaces, or where exposed to severe attrition, it may be made almost as hard as adamant by pressing out all superfluous mercury and packing with warm instruments." * * *

"I have not the slightest hesitation in saying that it is the only amalgam I know, that will absolutely preserve, and not discolor the teeth. In some mouths, the filling turns quite black, but the tooth is never discolored."

Dr. Frank R. Faber gives his treatment of soft and tender mouths, his remedy is *Phenol Sodique.*

In the discussion on Artificial Crowns before *The American Dental Association*, Dr. W. N. Morrison protested against forcing the band under the gum.

Under the head of Operative Dentistry Prof. E. T. Darby says he does not fill the anterior teeth of children with gold, until the fifteenth year of age is reached. Dr. O. E. Hill agrees with Prof. Darby.

A correspondent in the *Ohio State Journal of Dental Science* tells us that "Vitalized Air (?) is a mixture of chloroform and nitrous oxide, in indefinite proportions, and was tried nearly twenty years ago, and condemned as being too dangerous for general use.

"Its recent revival is due to a charlatan."

At a late meeting of the *Ohio State Dental Society*, Prof. Taft offered the following:

Resolved, That this society declines to certify any student for a beneficiary scholarship in any college." Adopted.

Prof. Smith says, The preliminary examination is all bosh. He was reminded of a remark by the late Prof. Buckingham: "If you want to find out all about a thing, go to some one who has the least opportunity of knowing anything about it. The worst students we receive are those from dental offices, the voluntary students who come without office pupilage are the best."

The Society suspended two members for unprofessional conduct. Served them right.

Editorially.—Dr. Watt, of *Ohio State Dental Journal*, thanks his friends for their kindness during the year just passed, and says—"Don't tell us you can't write; for we know you can—that is, very many of you can, many who claim inability in this line. * * *

"We now recall two contributors who have repeatedly insisted that they cannot write, while really they are the special writers in our profession." Dr. Watt knows what he is talking about, and we hope he may be able to convince many in the profession that they are mistaken when they claim inability to contribute to our literature.

In same journal Dr. J. W. Lyder states that he "picks the fibres from a sheet of Robinson's fibrous foil, mixes them with the fluid of the cement, then incorporates the mixture with the powder, and fills as usual. "This gives nearly a metallic surface, and a smooth one, for the fibers can be burnished down on the surface."

We are trying this plan and will report success or failure after sufficient time has passed in which to test the filling.

The Journal of the British Dental Association—December. During the year just past a Dental Benevolent Fund has been established. The Midland Branch of the British Dental Association held on December 8th an interesting meeting. Clinics demonstrating various modes of filling with gold was an interesting feature.

The following subjects were considered: "Cancerous Diseases of the Tongue and Mouth," by Mr. Bennett May. "In his experience, one of the commonest causes of epithelial cancer of the tongue was the fraying and irritation caused by carious teeth."

Dr. Walker related his successful replantation of teeth, accidentally displaced.

Mr. Spence Bate "believed that a union would take place between the pulp within the cavity and the external tissue if placed together early."

Mr. Roberts read a paper entitled, "Is Tobacco Injurious to the Teeth?" The members agreed that tobacco smoking was not injurious to the teeth.

The B. D. Association nnmbers over 500 members and consists of five branches. H.

MISCELLANY.

DAMAGE TO THE HEART FROM INHALATION OF NITROUS OXIDE GAS.

BY J. W. DOWLING, M. D., PROF. OF PHYSICAL DIAGNOSIS AND DISEASES OF THE HEART AND LUNGS, NEW YORK HOMÆPATHIC MEDICAL COLLEGE.

To the Editor of The Medical Investigator.—The brief article in this week's issue of your valuable journal under the above title, by Dr. W. Ottley, reminds me of an interesting case which occurred in my practice some two years ago. A lady visited one of our popular establishments for the extraction of teeth, where nitrous oxide gas was administered. Without difficulty she was placed under the influence of the anæsthetic, when a number of teeth were removed from her upper jaw. The operation was performed successfully by a skillful dentist who was also a graduate of a medical college. After the removal of the teeth, to his surprise and horror, consciousness did not return; fifteen minutes passed; half an hour, an hour; during which period restoratives of different kinds had been applied without the slightest effect. Becoming alarmed, the doctor ordered a carriage and with the assistance of his attendants, carried her to it and conveyed her home. She was placed in bed still remaining unconscious. The doctor fearing that it would reflect discredit upon him, neglected sending for counsel, but prescribed himself for the patient and left, saying he would return in a short time. At the end of two hours he visited her again, but her condition was unchanged. Thoroughly alarmed, but still fearful for his reputation, he remained at her bedside all night, informing the family that as the action of the heart was good, the condition was trivial and he was fully competent to manage the case by himself. The morning found her in the same state. and so she continued during that day and the following night, having occasional involuntary discharges of urine, and partaking of no food but swallowing at intervals a small draught of water which was placed in her mouth. On the third day, the friends were so alarmed that they dismissed the doctor, and on the recommendation of some member of the family, sent for me.

On visiting the patient, I found her a frail woman of about thirty years of age, thoroughly blanched and totally unconscious. Her respiration was rapid, pulse beating at the rate of about one hundred and twenty a minute, pulsations feeble but regular. Physical examination revealed a right-sided hypertrophy of the heart, the apex being misplaced to the left, but still in the fifth intercostal space. There was a marked præ-systolic thrill, very perceptible to palpation over the præcordial region to the left of the sternum. Auscultation developed a loud murmur, præ-systolic in time, heard with greatest intensity at the apex, and not conveyed to the left, not heard at the base of the heart. and not heard in the neck, where the arterial sounds were remarkably feeble. The second sound at the pulmonary orifice was much louder than that at the aortic orifice. Both sounds at the base were pure, as also at the lower portion of the sternum, where we study the sound as generated at the tricuspid orifice.

Diagnosis.—Stenosis of the mitral orifice, the murmur undoubtedly having its origin at that orifice and being produced by the passage of blood from the auricle into the ventricle through a deformed and constricted valvular opening.

On inquiring of her friends I learned that some years previous the patient had suffered from an attack of inflammatory rheumatism, which had confined her to the bed for several weeks. From that time to the present she had never been "the whole of her former self." She had been short of breath upon exercise and upon ascending stairs. Had had occasional attacks of dyspnœa, obliging her to sit for hours with her body bent forward. In fact had been unable to attend, as formerly, to her household duties.

I asked if the physician had made any examination of her heart prior to or since the administration of the gas, and was informed that he had not.

Under the influence of digitalis the impulse of the heart became less frequent and stronger and she gradually regained consciousness, but some weeks elapsed before she was restored to her normal state of health.

So far as I have been able to learn, no permanent injury was done to her already damaged heart. I have always thought that the condition of unconsciousness was owing to an anæmic condition of the brain, resulting from feeble heart-action, and that this enfeebled state of the heart was due to the poisonous effects of the nitrous oxide gas. The case is an interesting one and shows the importance of a thorough physical examination in all cases, prior to the administration of this anæsthetic.—*U. S. Med. Investigator.*

DAMAGE TO THE HEART FROM THE INHALATION OF NITROUS OXIDE.

In *The Lancet*, vol. i., 1876, p. 689, Mr. Cartwright makes some important observations on some of the serious consequences which may follow the inhalation of nitrous oxide, particularly with reference to the effect of repeated inhalations on a heart whose walls are already weak, though its valves may be competent. I have lately met with a case which appears of considerable importance, as showing the effect that several inhalations of gas may have on a heart whose valves have been affected without there being much consequent affection of the walls.

Miss F. O.——, aged 20, had her first well-marked attack of rheumatic fever in July, 1876. After it had lasted more than three weeks, the fever recurred, and it was during this attack that endocarditis was first set up; a mitral murmur of considerable intensity remained after her recovery. In January of the following year she had a second attack of acute rheumatism, which passed off, leaving the murmur in much the same condition; but, as she continued to have rheumatic pains and a good deal of palpitation and dyspnœa, she was sent to Bath, where, under Dr. Spender's advice, she derived much benefit from the baths and other treatment, "the heart became stronger and the murmur less intense," as he has been kind enough to inform me. A second visit in the following year was also attended with benefit, and my partner, Mr. Bartlett, under whose care she had been all this time, found that on her return the mitral murmur was no longer audible. On October 7, 1882, I was asked to examine her heart in order to decide whether she might safely inhale nitrous oxide preparatory to having some teeth drawn; and as at this time no murmur was audible, and her heart, though somewhat enlarged, appeared in good condition, I had no hesitation in advising her to have the operation performed under nitrous oxide. Accordingly, on October 17, she had two teeth extracted while under the influence of gas, and again two on the 21st, when, evidently something did not go quite right. The administration had to be interrupted. The patient felt some pain at the time, and complained afterwards of violent headache and a feeling of confusion, though after the first administration she had recovered quickly. She experienced palpitation in bed two nights after this. A few days later she returned home from the town where the teeth had been extracted, and, on October 28, I was asked to examine her chest, as she had been coughing a great deal and had further attacks of palpitation, and to my surprise found that a loud mitral murmur was again present, conducted towards the left, though not audible at the angle of the scapula; the apex beat was in the nipple line. where it had been before.

I should add that in this patient the murmur has the peculiarity of being very much louder in the recumbent than in the erect position. This to some extent may explain the apparent disappearance of the murmur previously to the administration of the nitrous oxide, as she was only examined by me while sitting up; but I have no doubt that this does not account for all the difference that is now perceptible, for at present not only is a distinct systolic apex murmur audible while she is standing, but also she complains that her palpitations and shortness of breath have returned much as before. It appears to me therefore quite clear that the nitrous oxide must be held to be responsible for her present condition; and I have advised her for the future to submit to the pain of extraction rather than to run the risk of further damage by inhaling any anesthetic.—*Walter Ottley, F. R. C. S., in The Lancet.*

CANCRUM ORIS LEADING TO NECROSIS OF LOWER JAW.

At a meeting of the Pathological Society of London Mr. Cripps showed the *débris* of an inferior maxillary bone taken from a child two years old, a patient at St. Bartholomew's Hospital. The child had been quite well until a fortnight before admission, when it began to be feverish. On admission, there was a large swelling over the right lower jaw. The swelling increased in size, and superficial ulceration set in. Ten days later, the whole mass sloughed, and the child died. Post mortem: the whole structure was found converted into a clay-like substance, and in the *débris* were the remains of the bones. The interest of the case lay in the diagnosis. The ulceration was much slower than in ordinary cases of cancrum oris. There was no history of measles, nor of phosphorus poisoning, nor of the child having taken mercury. A favorite cat had suffered just before from a swelling of the nose and mouth, for which it was killed, and it is possible that the child had been infected by it.

Mr. Morrant Baker had seen the case during life, and agreed with Mr. Cripps that it was not an ordinary case of cancrum oris.

Dr. Dowse had seen three cases closely resembling this one in a family after measles.

Mr. Macnamara suggested that the case was one of acute necrosis rather than of cancrum oris. He had seen a case of this disease in an infant.

Dr. Sharkey had seen a case of cancrum oris in which the whole upper jaw on the right side came away in one piece.

Mr. Cripps, in reply, could not accept the view put forward by Mr. Macnamara that the case was one of acute necrosis, using the term in the same sense as applied to acute necrosis of bones of the limbs. In the latter case, the necrosis was primary, the bone died rapidly throughout its whole length, and the soft parts were involved at a later period; in the case he had described, the soft parts were first involved, the necrosis spread slowly, and was evidently secondary.—*Brit. Med. Journ.*

NECROSIS OF JAW DUE TO A FRAGMENT OF TOOTH.

Dr. Post narrated the following case: A sequestrum of the lower jaw, which he presented, was removed six or eight weeks ago from a young man, who, about two years before, applied to a dentist to have a bicuspid extracted. The tooth was broken, and the principal part of it was left behind; no immediate irritation followed, but, after a lapse of a year and a half, inflammatory swelling occurred over the bone, and portions of dead bone were discharged, together with the remnant of the tooth. For a long interval thereafter no fragments of bone were discharged. When the patient applied to Dr. Post there was a sinus leading to roughened bone. He cut down and removed the sequestrum shown. The special interest of the case was with reference to etiology. The necrosis came on at a somewhat remote period after the breaking of the tooth, a part of which was left behind; then irritation increased until a considerable portion of the jaw had to be removed.—*Proceedings N. Y. Med. and Surg. Society, in N. Y. Med. Journal.*

NAPHTHALIN AS AN ANTISEPTIC.

Owing to the occasionl startling constitutional effects produced by the topical application of iodoform, attempts have been made in various directions to discover some antiseptic which would be as useful as that drug, but free from its disadvantages. Fischer (Strasburg) claims that he has found such an antiseptic in naphthalin.

Naphthalin is available for all the purposes to which iodoform has been applied, and as yet no constitutional effects have been observed to follow its use locally.

It is as powerful an antiseptic and "antibacteric" as iodoform, and has a less disagreeable smell. Its application causes a slight transitory sensation of heat, but no pain. Anschütz states that very sensitive granulations sometimes bleed rather freely after it has been applied, owing to the sharp angles of the hard crystal. This can be obviated by using it in fine powder, though if there is much discharge it is then apt to form a crust on the surface of the granulations. When the crystalline form is used the discharges escape freely.—*Centralbl. f. Chir. Glasgow Med. Journal.*

NARCOSIS BY CHLOROFORM, BY ETHER, AND BY NITROUS OXIDE.

Neudorfer (*Deutsche Zeitschrift fur Chir.*) investigates the above, and comes to some highly important conclusions, which may be thus summarized :

1. Air can not hold more than twenty per cent of its bulk of chloroforom vapors at the ordinary temperature and pressure.

2. Chloroform acts as a poison upon the red blood corpuscles, but only slowly, even upon corpuscles at rest, whilst those circulating through the lungs are not long enough under its influence to be destroyed.

3. It has been found by Bernard, Grehaut, Hoppe-Seyler, and Hermann, that hæmoglobin has a greater affinity for carbon monoxide than for oxygen, and for nitrous oxide than for carbon monoxide. In other words, in presence of excess of carbonic oxide the blood cannot absorb oxygen, and in presence of excess of nitrous oxide the blood cannot take up either carbonic oxide or oxygen. Hoppe-Seyler and Grehaut think that if the weakest of these gases (in their affinity for hæmoglobin) be previously present in excess, it hinders absorption of the gases of stronger affinity. As to this, the authors think that it does not hinder this absorption, but that the latter are thus rendered innocuous, and also that the affinity of hæmoglobin for oxygen is not constant, but varies within certain limits.

4. If to an individual whose hæmoglobin has a relatively weak affinity for oxygen we give to narcosis a mixture of 20 volumes of chloroform vapor to every 80 volumes of air, he breathes a mixture holding 16 per cent of oxygen instead of the usual 20 per cent in the air, and it may happen that he may take up little or no oxygen, and the chloroform may exert its fatal effect. This is a simple and sustained method of explaining death by chloroform.

5. Now, arguing by analogy, since the very poisonous carbonic oxide can be rendered innocuous by the previous presence of other gases in excess, it is to be presumed that in a mixture of chloro-

form vapor and oxygen, the chloroform could not exert its evil effects upon the blood-corpuscles.

6. There would be no danger of oxygen-poisoning, for the quantity given would be within the limits of the variations of oxygen taken up in nasal respiration.

7. The bad after-effects of chloroform would be done away with.

8. Twenty per cent of chloroform vapor would be unnecessary, since three to five per cent are quite enough.

9. As to ether, it can be mixed with oxygen up to 43 per cent, but it can not compete with chloroform, because it possesses no constant chemical constitution, and its behavior to human tissues is more prejudicial than that of chloroform.

10. The mixture of nitrous oxide and oxygen acts equally as well as the chloroform and oxygen mixture.

11. Oxygen is easily administered by Limousin's apparatus.

12. Narcosis thus caused is absolutely devoid of danger.—*Brit. Med. Journal.*

EXPLOSION OF A TOOTH.

A patient recently came to a dentist to have a tooth extracted. It was the right inferior first molar, and was split half in two from crown to root. Upon inquiry, it appeared that for several days the tooth had been paining him very severely—growing longer and being extremely sore to the touch. The pain continued to increase until the night previous, when, all of a sudden, something seemed to crack in his mouth, and the pain at once ceased. The patient thereupon discovered, with his tongue, that the tooth seemed to be divided. No doubt the splitting was occasioned by an accumulation of gas in the pulp cavity.—*Brit. Jour. of Dental Science.*

CORRESPONDENCE.

"Kind messages that pass from land to land."

Editors Archives of Dentistry.—Why could not the State examining boards perform a duty they have not heretofore undertaken? I allude to the examination of candidates for the dental degree. It has been very truly said that there is a lack of uniformity among the dental colleges in the standard for graduation. At present, I understand that the examinations are conducted solely by the faculties of the colleges. I believe it has been suggested that it would tend to greater uniformity if others than faculty members took part in this office. Probably the colleges would insist on being in some way represented at the examinations of their proposed graduates. Perhaps the examinations might still be made by the faculties, members of the examining boards being present, and the approval of the board in each State being required before the degree is conferred by the colleges in their respective States. It might be necessary to enforce the condition that each member of a board should be a graduate. I believe in some of the States the boards are not so constituted. In any case the boards should be composed of men competent to decide upon the qualifications of candidates for the dental degree.

I offer these suggestions for the consideration of your readers, in the hope that the views of others may be elicited, and if there is any merit in the hint, the question may be further discussed.—J. P.

EDITORIAL.

THE first month of the year had about expired when the publication of the ARCHIVES OF DENTISTRY was first determined on. Since that time matter for this number has been obtained, a printing office organized, and many other things done necessary to the issue of a dental monthly. This number has been prepared by an impromptu committee, temporarily appointed to furnish matter for the initial number, the permanent editorial staff not having yet been chosen. It could not therefore be expected, under existing circumstances, that this number should be a fair specimen of what it is proposed the ARCHIVES shall be in the future. Yet we ask as a favor, that all who receive a copy, will suspend criticism upon its contents, until it has been read *through*, from beginning to end. After that has been done criticism is invited, in the belief that it will be kindly received and wisely acted upon by the future conductors of this journal.

Future numbers will succeed each other at intervals of less than a month, until the regular issues are up to time; after which, the journal will appear at the first of each month.

The Missouri Dental College acknowledges, with thanks, two very interesting pathological specimens. A right lower first molar with three separate roots, a linguo-distal of unusual development. The other a bicuspid, the root flexed backward upon itself, describing a complete circle exostosed to some extent. From Dr. J. E. Brecht of Carrollton, Ill.

LISTERINE.

We have long felt the want of a safe and not disagreeable substance that is both antiseptic and disinfectant. Carbolic acid is a powerful germicide, and is therefore antiseptic; but it is not a disinfectant; nor does the much used creasote possess this valuable property. As a coagulator of albumen carbolic acid is all that can be desired; its anæsthetic property is also sometimes serviceable, and both it and creasote have qualities that will ensure their retention in dental materia medica.

But what the dentist most needs in this line is a prompt, effective, safe, non-irritant and agreeable disinfectant. If to these qualities there is added that of a non-toxic and reliable antiseptic, such as we have in Listerine, so much the better; there is little more to wish for in one preparation.

Our experience with Listerine has been short, but it has already become an indispensable article upon our table, and has banished several substances that formerly held place there. We commend it for trial, in the belief that as a deodorizing and antiseptic combination it has no superior.

VICK'S FLORAL GUIDE.

Vick's Annual comes as regularly as Christmas, and is almost as welcome. It is an elegant book of 136 pages, having 3 colored plates of flowers and vegetables and a very large number of other illustrations. It is a gem in its way, and has never been equalled by any of its competitors. It can be had by anyone who sends an order for ten cents worth of seeds for garden or vegetable. The seeds are first class. Address James Vick, Rochester, N. Y.

THE

Archives of Dentistry.

A Monthly Record of Dental Science and Art.

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ORIGINAL ARTICLES.

"Of all the arts in which the wise excel,
Nature's chief masterpiece is writing well."

DISEASES OF THE PERIDENTAL MEMBRANE AND ASSOCIATE PARTS.

Synopsis of Dr. G. V. Black's Lectures at the Missouri Dental College.

[Reported for the Archives of Dentistry.]

CLASSIFICATION.

1. Traumatic pericementitis; or such as result from direct injuries.
2. Pericementitis; or inflammation resulting from death of the tooth.
3. Gingivitis.
4. Calcic inflammation, affecting the gums and peridental membranes; or such as result from accumulations of calculus.
5. Phagedœna pericementi; a specific infectious disease of the peridental membranes, tending to destroy them, with consequent loss of the walls of the alveoli.

Dr. B. insists that the term "Pericementitis" should, when used without qualification, be limited to that form which results from the death of the tooth's pulp, either immediate or subsequent. This form is now well recognized by the profession under that name standing alone. While the naming of other forms are not so well established; they should therefore, be qualified by an adjective to designate them—as Traumatic Pericementitis, Phagedemic Pericementitis, etc., if that term be employed.

The traumatic inflammations were passed with some brief remarks as to their more usual forms and treatment.

In the treatment of the next form—Pericementitis—the Dr's splendid set of illustrations of the subject, including the resultant alveolar abscess—was used, which made the talk of special interest—without the illustration, however, a synopsis would be rather lame. Dr. B's methods of treatment do not differ radically from that of other well informed members of the profession.

One point, however, deserves mention : In case of pericementitis threatening abscess, the mucous membrane is dried and kept so, by napkins. Then a drop of carbolic acid is taken on the point of a blunt instrument and placed at the point most suitable for making an opening to the peridental membrane. The eschar caused by this is removed by a light scratching motion of the blunt point. In case the tissue is hard and tough, the point of a serrated plugger may be used instead, always béing careful to go very slowly.

If blood is drawn, the operation is proceeding too rapidly. When the carbolic acid has become thick by admixture of the material of the eschar, it should be dried out and a fresh drop added, as at first, and the operation continued as before, always keeping the carbolic acid in advance and picking out the eschar as fast as formed, until the bone is reached. Then with a small flat instrument, wet with a fresh drop of acid, as before, carefully raise the periosteum from the bone, over a space sufficiently large. Now select an excavator suitable for the particular locality, and cut through the alveolar wall to the peridental membrane close down to the apex of the root. This operation, if done skillfully, is practically painless. It can be done in a few minutes and without complaint usually from the most nervous patients. After the operation the pain quickly abates and the inflammation readily subsides; and the wound heals by granulation within a few days.

The various forms of alveolar abscess were graphically illustrated and their treatment described.

Gingivitis was described as an inflammation beginning in the gland like cells immediately around the neck of the tooth. These cells, while not presenting fully the morphological character of a gland, seem to act as such, and are caused to inflame by certain medicaments, notably, by mercury, and the iodide of potassium. Many things cause gingivitis. It may also be caused by local irritants. It requires, usually, no other treatment than the removal of any local irritants, if such be present. In its simple form it is oftenest seen in young persons,

Calcic inflammations were treated at some length, and the line between this and phagedena pericementi, or phagedemic pericementitis closely drawn.

Calcic inflammation is due to the irritation caused by the presence of salivary calculus, the peridental membrane below the calculus may be congested, turgid, inflamed, but not destroyed, except as it is encroached upon by the calculus. While in phagedenic inflammation the peridental membrane is destroyed in advance of the calculous desposits usually in the form of deep pockets, often extending deep down between the tooth and the alveolar wall. This form of disease may, and often does destroy the peridental membrane and cause the teeth to drop out, without the presence of calculus in any form.

Calcic inflammation, also, often causes the loss of the teeth by its encroachment upon the membranes and alveolar walls, causing their absorption.

The treatment recommended for calcic inflammation was to remove every trace of calculus. Here the Doctor exhibited the instruments he used for this purpose, a set of very thin, flexible blades bent at different angles, so that every part of every tooth and root may be reached. These instruments have no hooks, all are thin square points, used with a pushing motion.

The necessity for the removal of the last trace of calculus was insisted upon as the only possible remedy.

Afterward the use of chloride of zinc or other astringent was recommended in case there had been severe inflammation, otherwise the case might be left to itself. But the patient must in all cases be taught how to clean the teeth and keep the calculus from again collecting.

Phagedemic pericementitis was described as a specific infectious disease, which may exist with or without collections of calculus. It is essentially a parasitic disease, caused by a peculiar fungus, and is infectious. It is to be distinguished from simple calcic inflammations, by its tendency to destroy the peridental membranes, without the presence of calculus, or in advance of calculus, if such be present. This destruction, is generally seen, in the earlier stages, in the form of deep pockets between the tooth and the alveolus, spreading deeper and around the tooth.

The destruction of the bony walls of the alveolus follows quickly upon the loss of the peridental membrane. And if very close examinations be not made it will seem that all is destroyed together.

It was claimed that the hard dark colored calculus found deposited under the gum, and deep down on the root was a deposit from the exuded serum, and was, therefore, called serumal calculus. This was first pointed out by Dr. Brown, of Georgia, and very ably explained by Dr. Ingersol, of Iowa, under the title of "Sanguinary calculus." This calculus was not held to be pathognomonic of phagedemic inflammation. It may be found in any case where there is a long continued exudation of serum, provided there be a nidus to determine its collection. It is occasionally found upon the apex of the roots of abscessed teeth. The treatment recommended was: 1st. remove all concretions, and that this be done with absolute thoroughness was insisted upon. The difficulties in the way of its accomplishment were explained and the necessity of thorough training of the hand urged. A cure cannot be expected as long as any concretions remain to keep up irritation. In case there were no concretions, none would require removal but in all cases concretions should be closely looked for.

2. The removal of badly diseased margins of the alveolar walls. In simple calcic inflammations there was no necessity for removal of the alveolar margins, as the tendency is to a speedy recovery of the health of the parts, but in phagedemic inflammation a cure is often more speedily accomplished, by removing the diseased margin. It should be removed in most cases when the gum is found parted from the outer lamina of the wall. Also when the wall is found thickened on its outer side, as the destruction is going on, on the side next the tooth, so that the edge of the alveolar wall is turned over like the rim of a cup; a cure is more easily accomplished if the rim be cut away. It is not necessary that the bone be actually removed ; but it should be so broken up that the soft parts will lay in close proximity to the neck of the tooth. Necrosis of the alveolar walls occurs but rarely; these walls are removed by a molecular disintegration, not by necrosis.

except in rare instances. The soft parts should be injured as little as possible. They should not be cut away except in some very rare instances, as this course leaves little or no hope of a reproduction of the lost alveolar wall; a point to be sought in the treatment of this affection.

3. The indications for medication are two fold: 1, to stimulate the anemic and sluggish tissues to renewed activity: 2, the distruction of the microscopic organisms. For this purpose our materia medica furnishes us with many drugs that will be found good and efficient, if properly applied. The remedies should be applied just at the point desired; the deepest parts of the pockets, with a drop syringe. The use of cauterants is to be avoided.

However, the treatment should always be begun by cleaning the pockets of all extraneous matters, by injections of per oxyd of hydrogen. This agent is probably a good parasiticide, but the mechanical effect of giving off free oxygen whenever in contact with pus, and in this way mechanically expelling every thing contained in the cavity, should reccommend it if it had no other property. After the purifying of the pockets in this way, they should be filled with a stimulating antiseptic lotion. This should be repeated twice per week until decided progress is made toward recovery, after which the intervals may be lengthened. Under this treatment the pockets will fill up, the gums re-attach, new bone cells will be thrown out, and the alveolar walls in a large part be re-formed.

The formula most in use by the Lecturer was this:

℞	Oil wintergreen	3 parts.	
	Carbolic acid (crystals)	2 parts.	
	Oil cinnamon	1 parts.	M.

This may be varied in the proportions, or by the use of different essential oils. The cinnamon, however, is the best stimulant to the sluggish tissues and should be retained.

Other formula were also recommended as:

℞	Strichnia alkaloid	grs iv.
	Oil Ricini	℥j

Mix with heat.

The essential oils may be substituted for the oil Ricini.

℞	Iodide of zinc	grs xii. to xxiv.	
	Water	℥j.	M.

The last was first used by Dr. Harlan, of Chicago, and is a very excellent remedy.

Many other formulæ will be found that will answer the purpose well.

In the course of the three Lectures, on these subjects, the literature of the last twenty years was pretty closely canvassed, especially upon the calcic and phagedemic forms of disease. The views of every writer who has appeared was canvassed, and his views briefly presented.

Dr. Sol Horine, of Missouri, was accorded the credit of the first introduction to the profession, of the method of treatment by the removal of the diseased edge of the alveolus, so widely claimed for Dr. Riggs, by his friends.

Dr. Harlan, of Chicago, introduced the per oxyd of hydrogen to the profession of this country.

SUGGESTIONS.

BY DR. H. R. NEEPER.

Cleanliness of person, instruments, and office should be the invariable rule of every dentist. If he is lax in either of the above, his lady patients are certain to observe it, and liable to comment on it afterwards.

Keep your office in such a manner that the first impression on entering will be that of a bright, cheerful place, and cleanliness will naturally suggest itself. Let your patient behold the operator arrayed in fine (clean) linen, clothes brushed and shoes polished. Don't forget to have your hands in good condition,—allow your patients to know you are washing them (the hands) and remember the reassuring odor of cologne.

Your patients always *look* when they enter the operating room. Let their gaze fall on a clean cuspidore, bright instruments and fresh chair covers. As your engine bit stand will be on your bracket table, it would be well enough to have your burrs clean and the excavators wiped off, The forceps should be cleansed as soon as possible after using. Use your napkins,—the patient appreciates them and if you don't use one, place it in sight. Don't have your impression cups smeared with old wax, plaster, etc., but have them bright and you will not want to hide them in your hand when selecting a suitable one. Keep down all *smells*. Iodoform, etc., should have a place in the laboratory. Bromo-chloralum, carbolic acid, etc,, should be used to disinfect the cuspidore. Use common salt in the cuspidore of your extracting chair—especially in warm weather. Be certain in regard to your own breath. Your stomach may be a little out of order or you may have a slight nasal catarrh Don't visit its disagreeableness on the patients, but give them the " odors of Araby."

The foregoing hints are of simple things and of absolute decency. We owe it to our patients to be as scrupulously clean as possible. The recommendation that " he is very clean and nice in his office," goes a long way toward securing new patients.

THICK RUBBER DAM.

For years I have been using medium rubber dam; tried some thin, but abandoned it as it was easily torn and was very troublesome on account of folding and easily getting into the way. Recently I have been using thick dam and find it possesses many advantages. You can punch a small hole in it and stretch the dam over a tooth without tearing it,and it hugs the tooth so closely that it is seldom necessary to use a clamp unless the tooth is far back in the mouth. It does not fold up and get in the way, does not cling to the face and produce an unpleasant feeling as is the case with thin and medium thicknesses. When preparing a cavity, having the dam in place, you are not apt to tear the thick rubber, nor will it catch and wrap around a bur, or onto a disk. I have been able to excavate, fill and finish a large approximal filling in a lower molar, without injury to the rubber. Try it. J. G. H

* * *

SOLUTION OF CHLORAL IN WOUNDS OF THE MOUTH.—M. Perier, of the Hospital Saint Antoine, Paris, recommends an aqueous solution of chloral, 1 part chloral to 100 of water, as a topical application in buccal inflammation resulting from traumatic injuries, or from the eruption of the third molar teeth. Also for injections in cases of necrosis, its disinfectant property suppressing the odor, while its sedative property rapidly diminishes both pain and inflammation.

DENTAL SOCIETIES.

COMMENCEMENT EXERCISES OF THE CHICAGO DENTAL INFIRMARY.

The opening exercises of the Collegiate Department of the Chicago Dental Infirmary were held Monday evening, February, 25, in rooms of the Infirmary, Nos. 24 and 26 East Adams street. Quite a large representation of the medical and dental professions including a goodly number of ladies, responded to the invitations. Some of the most eminent surgeons and physicians were present, and with very few exceptions our most prominent dentists. The president, Dr. James Swasey, on calling the assemblage to order, spoke as follows:

LADIES AND GENTLEMEN : The interest taken in the beginning of the second course of the collegiate department of the Chicago Dental Infirmary, including, as it does, many representative men in the medical and dental profession, to say the least is highly gratifying. The high requirements of the infirmary in its dental branches, is attracting the attention of prominent men in the dental profession throughout the United States; and the many flattering notices that we receive is an indication that we have struck the key-note in dental education. Perhaps it will be of interest to you to know something of what has been done the past year; for that purpose I will call on the secretary of the faculty, Prof. Brophy.

Dr. Brophy.—MR. PRESIDENT, LADIES AND GETNLEMEN : According to a custom long ago established, the secretary of an institution of learning is expected to make a report at the close of each session showing the progress during the course. To make such a report at the opening of the course, however, might be regarded as an unusual procedure; but in view of the fact that no report was made at the close of the last session, the faculty and executive committee have requested a statement at this time. The following therefore, is most respectfully submitted:

STATEMENT OF OPERATIONS PERFORMED IN THE INFIRMARY AND THE NUMBER OF ARTIFICIAL TEETH INSERTED.

For the treatment and extraction of teeth no fee is required; but where teeth are filled or artificial teeth inserted, a fee is collected sufficient to pay for the material used. No charge is made for treatment of diseases of the mouth and gums.

STATEMENT.

Gold fillings inserted,	415
Robinson's metal fillings inserted,	185
Amalgam fillings inserted,	39
Cement fillings inserted and adjusted,	174
Gold crowns,	16
Pivot teeth,	21
Roots filled,	100
Cases treated, cleansing teeth,	118
" " Pyorrhœa alveolaris,	20
" " Stomatitis,	15
" " Gingivitis,	23
" " Pulpitis	600
Irregularities,	5
Surgical operation for closure of cleft palate,	1
" " " necrosis of upper jaw,	1
" " " closure of lower jaw,	1
Teeth extracted,	500
Artificial teeth inserted,	1,092

At the first session of the collegiate department of the Chicago Dental Infirmary there were eighteen matriculates–four of whom possessed the degrees of M. D., twelve were undergraduates in medicine, and two entered on the provision made in the first commencement for the admission of practitioners in Illinois, licensed according to State law. There were no graduates at the close of the course. The class was not large in numbers, but the character and attainments of the gentlemen who composed it were of a nature highly gratifying to the management. The difficulties which have been invariably encountered by others, organizing and putting in operation educational institutions have not escaped us. The problem of procuring learned, efficient, and attentive demonstrators has been solved, and we now congratulate ourselves on having at the head of both operative and prosthetic departments, gentlemen well qualified to teach. The practical training here is according to the methods of Profs. Cushing and Haskell, an assurance that it will be thorough in every detail. The embarrassment under which we labored during the course of '83, on account of insufficient clinical material has been overcome, and we now have patients in numbers equal to our capacity to care for them. We anticipate a highly successful course, and we feel confident that our students will find here abundant employment both mental and manual, to satisfy the most enthusiastic.

The address of the evening was delivered by Prof. Wm. H. Byford, of Rush Medical College, his subject being "Dental Medicine and Surgery."

DENTAL MEDICINE AND SURGERY.

BY WM. H. BYFORD, M. D.

The subject of specialties in medicine is not only an important one but it is one of the accomplished facts of the times.

Some of us can remember when these important branches of our profession were in the hands of ignorant charlatans, and were exercised wholly for gain, and in such an unscrupulous manner that they were scouted by the general practitioner, and the men who practiced them denounced in terms appropriate to their deserts.

In addition to the reprehensible method of the charlatan specialists, there were reasons of a valid character why they were not in favor.

A retrospect of half a century will enable us to discover some of these reasons. The science and art of medicine at that time covered comparatively a very restricted field. Organic chemistry, now a subject so vast that it is said by chemists themselves " no one man can master it in all its details," was just beginning to be cultivated.

The microscope had scarcely been used in professional research; now who can master all the subjects upon which it has thrown so much light? The stethoscope had but just been applied to the chest; now its revelations are so extensive that but few can become accomplished auscultators. For many years it was restricted in its use to diseases of the lungs; afterward the heart came under its inspection, and since then that useful instrument in some form is applied all over the surface of the body. Some apply it to observe the movements of the brain—in fact wherever the vessels extend or the motions of the viscera take place.

Medicine and surgery have laid hands on physical and psychical science at all points where they may be made available in illustrating problems connected with physical pathology and therapeutics, until a man to comprehend our profession in all its details must attain almost universal knowledge. I do not believe a finite mind is capable of knowing everything now taught in medicine.

We can point to no individual now in existence, who has mastered the whole of medical science.

Thus it will be seen that medicine has outgrown man, and has necessitated a division of its appurtenances. Anatomy, physiology, chemistry and the other subdivisions require the combined efforts of many men the same as astronomy, natural philosophy, political economy and all the other teachable and practicable parts of general knowledge.

The limited capacities of individual man, make specialists a necessity. And if we look over the medical world we will see that the distinguished men in it are so because they are specialists. We talk of the distinguished surgeon, the distinguished obstetrician, the distinguished gynecologist or the great practitioner. Every expression of greatness is qualified by some special epithet explanatory of the peculiar qualification of the individual indicated.

If I were to formulate a definition of greatness, I would do it in this personal manner, viz.: While the common man may know something about a great many things, the great man knows all about some things.

I think I would not be far wrong if I were to say that in one sense it was the work of the specialist that built up the immense fabric called the science of medicine. What were Conisant, Lany, Laenac, Sir Astly Cooper, Benj. Brodie, Sims and other such men, and what are Paget, Barnes, Gross and Sir Spencer Wells, but cultivators of special subjects connected with medicine?

But if the older ones of us go back in memory to their student days and enumerate the subjects taught at college and the number of books we were compelled to read to become doctors in medicine, we will find that they all did not embrace much more than is now contained in one of the magnified branches of the profession of the present times. We look with commiseration at the small amount of knowledge professed by our revered professors.

If specialism is a necessity it is no excuse for general ignorance. To be a good specialist, or to particularize, a dental physician and surgeon, to attain respectability, must first acquire a certain knowledge of general medicine. Modern dentistry is scientific dentistry; it is an outgrowth of medicine. It must spring from the general stock; as a graft it must draw its resources from the parent stem.

This cannot be done without the knowledge of anatomy, physiology, chemistry, materia medica, etc. How can a dentist unravel the intricacies of the diseases of the mouth if he is ignorant of the connections of its vascular system and its nervous apparatus? It is only in general pathology that we can find an explanation of the reflex and sympathetic effects of a diseased tooth;or,again,understand how the general state of constitution will cause the decay of the teeth, or how sound teeth can be made to suffer by some remote nervous disorder.

To the thoroughly educated dental surgeon the condition of the mouth and teeth make many revelations, and some of them much more reliable than if given in speech. They indicate the chemical character of the water we drink, and to a certain extent the food we eat. They discover to the experienced dentist the presence of conditions of the blood, as anemia, hydremia, oligemia or syphilemia; whether the patient has gout, dyspepsia, or consumption; and what our vices are.

As physicians and surgeons all well know, the mouth is the great index to the sanitary condition of the body, and is it too much to expect that some wise dentist will find recorded in the interior of the mouth, such marks, lines and eminences, and in the color, shape, consistency and direction of the teeth as will enable him to erect a better school of divination than those of palmistry and phrenology?

Indeed even now the sinner whose interest it is to conceal a great number of misdeeds shonld be careful not to open his mouth too wide while sitting in the dental chair.

The profession of dentistry—for although a specialty in medicine it is sufficiently extensive and important to be called a profession—is an honorable one. To be a competent dentist now, one must be an educated gentleman, and as such will occupy an elevated position in society. It is a lucrative profession, and for this reason affords a sufficient income to support some pretentions in the world.

These honorable and lucrative attributes are also founded upon the very valuable services rendered to the public.

Pain is the term applied to the most afflicting physical suffering; and toothache is recognized by everybody as the very focus of all pains. Now I submit it as a serious proposition that the cure of that atrocious soul-harrowing agony would of itself entitle dentistry to be called an honorable avocation. Very few of us are so fortunate as not to require the services of the dentist for the toothache.

It is a singular fact, experienced by about all mankind, that while the teeth are the strongest and hardest organs in the whole body, they are the soonest to give way. How many people lose their teeth before they are adults! I need not stop to enquire the causes of this premature loss: that is one of the problems of pathological dentistry, and can doubtless be solved by these erudite teachers in that art.

The invention of the skillful practitioner may stay this early decay of the teeth and preserve these sentinels and purveyors of nutrition. We all know poor teeth lead to insufficient mastication; that, to indigestion; and that again to manifold bodily infirmities, and these often to death. The position of them at the portal of the reservoir of all vitality, attests the prime importance of the teeth; and the fact that their function is initial to the whole process of the nutritive changes that result in the formation of the structures of the body shows their value. How all-important, then, must be a knowledge of the diseases of these organs.

To the senile mouth dentistry comes as a rejuvenating influence. The old man condemned by the loss of his teeth to unsatisfactory feeding would be doomed to infirmities which would cause great suffering and earlier decay were it not for this beneficent art. Dentistry not only gives the aged more endurance, but it restores to them the luxuries of the table and good living, that insure both happiness and longevity.

The unsanitary influence of a mouthful of rotten stumps is a thing so patent that it would hardly seem worth mentioning if it were not frequently overlooked. Many cases of troublesome chronic diseases cannot be cured without the aid of dentistry; and in the correcting and purifying of this primary receptacle of the food that sustains our life are undoubtedly many times the means of saving life as well as restoring health.

In one less important respect, the preservation and restoration of beauty is a great social service rendered by dentistry. I am rather inclined after saying it to apologize for placing the preservation and restoration of beauty in the category of the minor blessings of dentistry. Life without beauty might, after all, bé not worth much to us. Dentistry often carries the beauty of youth down the stream of life much beyond its natural limits.

How much these considerations and many others show the independence of general medicine and this branch of it, must be evident to every intelligent observer.

But there is one other thing I must place to the credit of dental surgery that is too important to be omitted. The most brilliant and most beneficent of human discoveries must in all fairness and candor be attributed to the dentists—I allude to anesthesia. Whether to Wells, Morton, or Jackson be awarded the honor, the discovery was due to the search for some means to ameliorate the awful pain experienced in the extraction of teeth according to the old methods. The demonstration was so complete and so obvious that the invention was seized upon by the surgeon, the physician and obstetrician, until now its beneficent influence may be said to be incomparable and universal. The amount of suffering prevented and relieved by this great power is beyond all possible calculation, or even comprehension. And I would repeat that no other invention can compare with it in sterling worth.

What renders the honor still greater is that ether, the anesthetic first fixed upon by the American dentists, after half a century of search, has been shown to be the safest and most efficient of all anesthetics. It is not necessary to mention any of the marvelous and fairy-like instances in which this wand of medical science has instantly swept away human agony, to convince this audience of the truth of all I have said and more than I can possibly say in favor of anesthetics, and also that the credit must be given to dentistry.

This was an invention of dentistry while in its infancy. Now that the art is assuming such magnificent proportions, may we not reasonably look to it for much more that is great?

Is there not some living dental surgeon or some one to come in the future, who, through his subtile ingenuity, will invent an instrument so fine and discriminating in its touch as to enucleate from its periosteum any root of a disordered tooth, and thus leave a generating couch from which will arise a new and sound tooth?

In the light of the grand strides of invention made in the nineteenth century this may be regarded as a possible achievement. Although a knowledge of the subjects taught in the thorough study of the profession is indispensable to the attainment of the higher walks in Dental Surgery, special instruction is necessary to prepare the student for the practical adaptation of his professional acquirements. There may be some more of local anatomy, some more teaching in reference to the structure of the teeth; but the student must also be taught the metallurgy, chemistry, and mechanics of dentistry.

These are the subjects of demonstration and practical manifestation.

This association of Practical Dentistry has been formed to teach this part of the profession. The teacher takes the student to the patients to examine, diagnosticate, and determine the therapeutics of the different cases. And then they show them how to prepare and apply the remedy. In the practice of medicine and surgery this is called the clinical teaching. I hardly think that term applicable in this case. Perhaps the right term would be sellacal teaching, as the patient is not lying in bed but sitting in a chair.

The Dental Infirmary must prove of great advantage to the advanced student: as the work done here by the accomplished and experienced teachers, places him at once in possession of the most approved methods; and in it he learns to act the Dentist in a manner to show his familiarity with his art; while without such practical instruction his awkwardness would betray the novice.

The facilities afforded by a large city like Chicago in supplying abundance of material for these practical demonstrations, and competent men to lead the student through the complicated difficulties that always present themselves to the beginner, will prove of great value and be properly appreciated.

I think the whole profession are ready to acknowledge the obligations under which the enterprising Dentists of this city have placed it by the establishment of this useful school and will manifest its appreciation of it by awarding to it liberal support. And the public is an equal debtor for the amount of charitable work done here for the worthy poor of the city. In point of merit it must rank with the best benevolent institutions in Chicago.

In behalf of the medical profession at large I feel justified in thanking the association for this charity and school, and wish it prosperity and success in all future time.

ADDENDA.

A beautifully engraved silver cup presented to Prof. L. P. Haskell, of the Chicago Dental College, by the faculty and students of the Baltimore College of Dental Surgery was on exhibition. Prof. Haskell delivered a series of lectures and clinics at the last session of the Baltimore College, and as a token of the esteem in which he is held, and in appreciation of his lectures and clinics, this beautiful souvenir was, in behalf of the faculty and students presented to him. After the presentation, Prof. Haskell replied in a few appropriate remarks, which met with hearty applause.

The students and many prominent dentists of Baltimore evinced a keen interest in Prof. Haskell's clinics and lectures.

SELECTIONS.

ATMOSPHERIC PRESSURE IN ITS RELATION TO ARTIFICIAL DENTURES.

BY AMBLER TEES, D. D. S.

Read before the Illinois State Dental Society, May, 1883.

About thirty years ago, when it was customary to exhibit artificial dentures at the various fairs in competition for awards of merit, it was suggested by at least one of the dental journals that it was not the proper way to judge of the ability of a dentist, nor of the value of a set of teeth ; that the award was just as apt to be given to a student, or a laboratory journeyman, who knew nothing whatever of preparing the mouth, adapting the plate or articulating the teeth ; qualifications which distnguish the dental surgeon from the mechanical workman. Such exhibitions were therefore discouraged, and have gradually fallen into disrepute, but few, at the present day, resorting to that method of advertising their skill. The exhibition of the higher styles of dentures has been taken charge of by tooth manufacturers and dealers in dentists' supplies.

In the restoration of mastication, speech and facial expression it should be our aim to have the substitutes that we give our patients for the lost natural organs, excellent in every particular ; to see that the plate fits well and gives no uneasiness nor pain, and to exhibit artistic taste in the selection of the color and size of the teeth and in their natural arrangement. It has been said, the assumption that work itself is unpleasant, that difficulty is always disagreeable, that exertion is generally painful, and that we labor merely for pay is the cause of so much inferior work. Let us combat this impression, and labor, not only for the reward, for that is sweet to the most of us, but also for excellence, endeavoring to do better day by day.

I wish to direct your thoughts to a highly important agent in securing comfortable adaptation of artificial dentures to the mucous membrane of the mouth, an agent which has almost wholly enabled us to dispense with spiral springs; I refer to atmospheric pressure.

The contact by atmospheric pressure of an upper artificial denture with the mucous membrane may be likened to the Magdeburg hemispheres. The denture representing one hemisphere and the superior maxillary bones and the cranium the other, the air within the mouth, within the nares and against the cranium causing the pressure. Adhesion is the union of two particles of one or more hard substances of the same or of different natures by means of a softer nature, which may harden or not afterwards, or the union of a hard and soft substance. Two boards pressed together by the hands do not adhere, for if the pressure be removed they will fall apart.

Confounding this pressure with adhesion it has been argued that a very heavy set of teeth endangers the mucous tissues, that such a set will in course of time tear away these tissues from their bony attachments. No fear, however, need be entertained from this source, for gums are rather compressed than otherwise, and in the same relative position between the bone and the plate as a piece of wax between the thumb and forefinger. The only part of the tissues which could be stripped off lies within the chamber. This is, however, subject only to a morbid growth which is seldom accompanied by inflammation; and this, in the majority of instances, only taking place when the vegetable bases or Cleveland chambers are used. A denture weighing sixty pounds with surface of at least four square inches, the pressure being perfect, could be sustained without affecting the mucous membrane more injuriously than a set weighing one-half ounce, because the lighter the set the harder the pressure against the gums, and by pressure alone can they be injured.

What is called *vacuum by contact* is when no chamber is used. The first plate was made in this way by Dr. James Gardette, of Philadelphia. About the year 1845 chambers were first introduced, and there have been several claimants for the honor of the discovery. I have heard that Dr. Mallett,of New Haven,stumbled upon the plan by making a plate from an impression which was imperfect in the roof of the mouth. Many dentists object to the vacuum chamber, but after years of experience I do not recall any cases in which any objections could be urged against its use. To form it I use thin pieces of wax base-plate. I have swaged, in a few instances, two plates for the same mouth, one with a chamber and one without, and have found the pressure so much stronger in the former that in every case I have discarded the latter.

Although an accurate impress is a prerequisite in making a perfect-fitting-plate with atmospheric pressure, yet there are many mouths which cannot be fitted from accurate impressions. This may seem paradoxical, but yet it is so; and the young practitioner who thinks that success is assured him because he has learned to take perfect plaster impressions, will become demoralized in this direction before many patients patronize him.

In many cases it is necessary to cut away the plaster casts in certain parts and manipulate a trial plate before a pressure can be established, so variable are the gums in thickness and density.

I have brought a few casts with me to show you in what kind of mouths this is necessary, and explain to you the way in which an experienced dentist can tell, when a patient comes to him for an upper artificial denture, by a slight examination of the mouth and the condition of the gums, whether he will be likely to encounter any difficulties or not.

Success in obtaining a firm pressure depends a great deal upon the curve of the posterior part of the roof of the mouth,commonly called the palatine arch. If it is peaked or egg-shaped, it will be necessary to manipulate the plate. It is better to use a trial plate, made of pure silver, No. 28. Then cut away the plaster cast at the posterior edge of the chamber and in other places where the gum is soft, and burnish the silver to conform to it until the pressure is established. Pure silver being very soft will readily yield to the burnisher. Plaster is then run into this plate and used as the cast for further operations. I will pass around a cast of a mouth of this description, showing where the plaster has been cut away. The lady had been wearing a rubber plate for a number of years of a poor adaptation, until I made her a continuous gum set and established a satisfactory pressure in this way.

If the arch is semi-circular, and the gums hard, the atmospheric pressure will be good.

An old gentleman called upon me several years since, and wished me to make him a set of teeth. He said he had been all over the United States trying to get a set of teeth with which he could masticate. The arch was very spongy and fissured. After many experiments upon properly locating the chamber, I was successful in getting a firm pressure by carrying its margins within an eighth of an inch of the center of the alveolar ridge, and posterior to all the fissures. The cavity plate was made of very thin wax.

Many plates ride forward after the air is exhausted, making a space, very often, an eighth of an inch between the anterior portion of the alveolar ridge and the plate. I correct this by swaging a pure silver plate, No. 28, and extending it only to the center of the alveolar ridge. This is placed in the mouth, the air exhausted, and an impression taken. A plaster cast is taken from this, with the silver plate remaining in it, and used to finish the set with.

In upper and lower dentures, the lower should be finished first, so that if any change has taken place in the position of the teeth, the upper ones can be changed to antagonize properly. Much care in articulating should be observed, since tilting of the plate and admission of air into the chamber is caused by carelessness in this respect. The upper bicuspids and molars should be so articulated that their cusps are directly under the alveolar ridge; and when the pressure if weak, the natural articulation of the lower ones should be reversed.

Much trouble and disappointment is occasioned, both to the patient and dentist, by inserting upper sets without supplying lost lower bicuspids and molars. These should be inserted and worn, at least a week or two, before the upper ones are made, and for the sake of his reputation, and the avoidance of much annoyance, the dentist should insist on this being done.

The slight shrinkage of zinc at the alveolar ridge makes it preferable for the male die in metal work. When the air is exhausted, it causes a pressure upon the alveolar ridge, and thus prevents the plate rocking. For the same reason, a shallow zinc die is better than tin in rubber and celluloid sets. Babbit metal, perhaps, would be better for a finishing die when the arch is high, since the pressure in such cases should be upon the palatine arch.

DISCUSSION.

Dr. Haskell.—I have been interested in this paper, and desire to recall a little of the history of atmospheric pressure plates. In 1844, Dr. M. P. Hanson, then practicing in Salem, Mass., conceived the idea of dispensing with spiral springs, then universally used in retaining full dentures, by the use of atmospheric pressure. His first attempt proved a complete success. Having swaged a plate to the palate without any air chamber, it adhered so strongly he could scarcely detach it. To test it fully he fastened a wire to the center, and attached a common water pail full of water, which the patient at once lifted from the floor and held suspended. He was, of course, delighted, and called some of his dental friends to witness the result.

A few years afterwards the "suction cavity" was introduced by a Dr. Gilbert, and generally adopted, why, I am not able to tell, for after usidg it myself for some years, I long since abandoned it, except in rare instances. All that is necessary is to raise the plate slightly over the hard palate, by scraping the impression,or by a thin film of wax on the cast, in order to prevent its rocking, sooner or later, from settling of the alveolar.

I find it necessary to make but little change in the plaster cast; always, however. scraping a little from the posterior where the margin of the plate would rest, except in the center, as the plate will always bear sufficiently at that point,

My test of adhesion is simply to press the plate firmly to the palate. There is no necessity for the powerful suction some aim to secure.

In mouths where the tissues are like a mass of jelly, no hard portions, except, possibly, in the center; there will always be difficulty, not in securing suction, but in steadiness of plate, in biting, as there is nothing for it to rest against. In such cases everything depends upon the antagonizing.

Throwing forward of plates, in some mouths, is owing to mobility of structure and deficiency of maxillary tuberosity; or, in some cases, to improper antagonizing. Too often there is not sufficient care taken in antagonizing. Many otherwise perfect sets are thus rendered very troublesome and sometimes useless.

There should be left a good space between the upper and lower front teeth, and even then, in the course of time, they are apt to interfere, and throw the plate off. And, very often, the last molars are left too long,crowding the lower plate into the flesh,and displacing both. Teeth a trifle longer one side than the other will make trouble. Too much pains cannot be taken to obtain exact articulation.

I use Holbrook's method on the lower jaw on a narrow ridge to relieve pressure, on a wide one, for suction. Do not leave the lower plate too wide.

Dr. Black.—In rather soft mouths, with small condyles, suction draws the tissue back,and on release it returns and carries the plate forward.

It is sometimes necessary to make the back part of the mouth sore to produce adhesions of the membrane at the back and render the soft parts less movable.—*Transactions Illinois State Dental Society, 1883.*

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Mr. F. Canton related a remarkable case of hæmorrhage after attempted extraction of a tooth. A policeman was sent to him by one of the divisional surgeons on account of profuse hæmorrhage into the mouth, which had continued for twenty-four hours. On examination Mr. Canton found that the bleeding came from a lower molar, the crown of which had been broken off, leaving the pulp exposed ; the pulp, which was the sole source of the hæmorrhage, was very sensitive. As the patient refused to have the stump extracted, Mr. Canton applied ice, and this after a short time stopped the bleeding. The tooth was extracted next day at the Dental Hospital, and no unusual hæmorrhage followed. Mr. Canton said he could scarcely have thought it possible that such profuse and long-continued hæmorrhage could have arisen from such a source.

The President mentioned the case of a gentleman then under his care, for whom he wished to fit a crown to the stump of a twelve-year-old molar, but whenever he attempted to clear out the anterior root such free hæmorrhage occurred that he was obliged to plug the canal and abandon the attempt. This had happened several times, and he was quite at a loss to account for such an unusual complication.

Mr. George Parkinson showed a large sequestrum removed from the lower jaw of a boy aged nine; the twelve-year-old molar was attached to it. The disease was said to date from the extraction of a deciduous molar at a general hospital four months before.

Mr. W. E. Harding, of Shrewsbury, said he had lately removed a large sequestrum, consisting of part of the body and ramus of the lower jaw, from the mouth of a gentleman who had had a lower wisdom tooth very roughly extracted some time previously. Although there was no trace of the inferior dental canal on the sequestrum, loss of sensation in the lower teeth and lip on that side had followed the operation, and he wished to know what prospect there was of his patient regaining sensibility in these parts.

A discussion followed, in which Mr. Walter Coffin, Mr. F. J. Bennett, Mr. Charles Tomes, Mr. Coleman, Dr. Walker, and Mr. Storer Bennett, took part, the general opinion being that the prognosis was unfavorable.

Dr. St. George Elliott then explained the result of his experimental tests of some of the best known amalgams now in the market. The results of the comparative tests were set out in the form of tables. showing the amount of shrinkage, the specific gravity,and the hardness, of fourteen different amalgams, as they were mixed dry, soft, or of medium consistence. He had read a paper on the same subject at the meeting ot the American Dental Society of Europe at Cologne in August last, but, not being quite satisfied as to the accuracy of some of the results, he had during the last five months repeated the whole of his experiments with increased care and precaution against error. The tables showed, first, that some of the amalgams took a good many hours. and even days, before they settled down into a state of rest, and that during this interval they passed through some very curious changes, the gradual contraction which took place in almost every instance proceeding very irregularly, and being occasionally interrupted by a slight expansion. Secondly, they show that, in order to get the best results, some amalgams should be mixed wet, some medium, and some as dry as possible, these results being in some cases quite opposed to the directions sent out by the makers. For instance,the "Sullivan" was found to give the best results when mixed of medium consistence, and better moist than dry ; whilst Ash's was best used soft.

Then with regard to the so-called "expansive amalgams," his experience showed that this expansion was only obtained under certain conditions, and not under all, as had generally been supposed. Thus Fletcher's expanding amalgam was found only to expand when used dry. Lastly, he had found that price was no criterion whatever as to the practical value of an amalgam, some of the most expensive not showing as good results as others which were sold at a very moderate rate. His experiments were even now far from being completed, but he hoped that the results arrived at thus far were of sufficient practical value to justify their publication.

Mr Weiss remarked that he was glad to see such old preparations as those of Hallam and Sullivan had stood Dr. Elliott's tests so well. Thus Dr. Elliott's investigations fully confirmed the result of those made by Hallam thirty years ago, and by Sullivan forty years ago. The practice had often been recommended of inserting very moist amalgam first, and then taking out the excess of mercury by putting very dry metal over it. Sullivan, as the result of very careful experiments, declared that this was bad practice; that the amalgam should be mixed soft and inserted in this condition, and Dr. Elliott's experiments seemed to confirm this statement.

Mr. Charles Tomes said that some years ago he had made some experiments with the same object in view, and he was glad to find that his results were confirmed by Dr. Elliott's. There was one point which Dr. Elliott appeared to have overlooked, viz., that the formation of an amalgam was probably in all cases attended by some rise of temperature; in the case of rapidly setting amalgams a very sensible amount of heat was produced. This rise of temperature would be attended by expansion of the mass, and so the initial specific gravity would be wrong. He thought that some of the unexpected results arrived at by Dr. Elliott might perhaps be thus explained, and he would advise that some experiments should be undertaken with the view of ascertaining the amount of heat disengaged by some of these amalgams under different conditions.

Mr. Walter Coffin said the influence of the heat of combination upon the determination of initial specific gravity was, as suggested by Mr. Charles Tomes, a very important factor in these experiments, but this could not even be estimated until something was known of the co-efficiency of thermal expansion of these alloys, about which unfortunately very little had been ascertained at present. The form in which the tables were made out rendered it difficult to judge whether the remarkable variations in the specific gravities were, or were not, within the ordinary limits of experimental errors, but on the whole he was inclined to think that some of the many physical disturbances to which such delicate experiments were liable, had been overlooked or not sufficiently allowed for.

The discussion was continued by Mr. F. J. Bennett, Dr. Walker, Dr. Cunningham, the President, and Mr. Hutchinson, after which Dr. Elliott replied. He did not pretend to assert that the results he had obtained were strictly accurate, but he believed that the errors were not great. The most careful precautions had been taken to guard against disturbing influences, and few of those present could have any idea of the amount of time and care necessary in conducting such experiments. — *Journal British Dental Association.*

ODONTO-CHIRURGICAL SOCIETY OF SCOTLAND.

At the meeting of this Society held on the 10th ult., at its rooms, 30 Chambers Street, Edinburgh, Andrew Wilson, Esq., L. D. S. Ed., President, in the chair, the paper of Dr. Kingsley, of New York, honorary member of the Society, on "Judicious and Injudicious Extraction," which appeared in the last number of this Journal, was discussed.

Mr. Rees Price opened the discussion with a few words on the order of eruption of the permanent teeth,remarking that he thought most members would agree with the order given in Dr. Kingsley's paper, in preference to that mentioned by Dr. Clowes. He agreed also with Dr. Kingsley in calling in question the statement that deciduous teeth should be removed when the time had arrived for their permanent successors to erupt. It was a common thing to see loose temporary teeth, and pieces of these, causing the immediate permanent tooth to erupt irregularly. But when a deciduous tooth appeared firm, and with no signs of its successor, one was not justified in extracting it, simply because its successor was due.

With reference to the extraction of the deciduous canines, Dr. Kingsley was very emphatic against so doing, and equally so Mr.

Coleman, and yet, as had been recently pointed out, the question was one which it was often difficult to decide. For himself, and he now spoke with special reference to the lower jaw, he was at times in doubt whether he was doing best for the patient in retaining the deciduous canines where the permanent incisors were very irregular. He was fully aware that in many instances, if the teeth were let alone, the irregularity did seem to right itself as the patient grew older. But in cases where one of the incisors was twisted or standing behind another, and within the arch, was it possible for the tongue and lips to do much? The usual plan was to leave such irregularity until a later period, and then to regulate with a plate (not easily done), or preferably, to extract one of the incisors. He ventured to think that this treatment did not promote regularity, though it might to some extent do away with overcrowding. To him it had been a great satisfaction to read the remarks of Mr. Woodhouse at the Plymouth meeting of the British Dental Association. This gentleman had stated that in many instances the deciduous canines in the lower jaw could be extracted with considerable advantage to the patient. The opinion was founded upon an experience of some thirty years, under exceptionably favorable facilities for observation and treatment,and was thus entitled to great consideration.

He would ask, what was the objection to extracting the deciduous canines? Was it not due to the tendency of teeth to approximate over a space during the stage of eruption? Thus (in the event of extracting the deciduous canines) the lateral incisor and the first bicuspid would appear more or less in contact, the cupsid appearing outside the arch. If these teeth did approximate he would take out the six-year-old molar, if incapable of being preserved, and allow the bicuspids to fall back, or preferably extract the first bicuspid.

The question seemed to be, were we justified in removing the temporary canines in cases of twisted or overlapping incisors of the lower jaw, where mechanical treatment was difficult at the usual age for regulating? On the other hand there was its strong condemnation by Dr. Kingsley and others, but on the other side a peculiar experience of the benefits to be derived from this treatment.

The last matter to which he wished to call attention was the remarks of Dr. Kingsley, as to which teeth should be extracted in irregularities. That where the canines were outside the arch, it was generally preferable to extract the first bicupsid he quite agreed. If the six-year-old molar had to go it was not because it was the best tooth to extract, but because it was bad in itself, *i. e.*, decayed beyond filling. Many dental surgeons still held that owing to its greater tendency to decay, the six-year-old molar should be extracted; with this he could not agree. He would ask how far want of cleanliness (which was common in patients from six to fifteen years) was a factor in this tendency. He had seen many cases where not only the six-year-old molars, but the centrals and laterals were decayed at an early age, due, he had no doubt, in great measure to this cause. Then it should be remembered that with the scientific treatment of to-day, good, serviceable teeth could be made of decayed six-year-old molars.

Another reason which had lately been advanced for the extraction of the six-year-old molar, was that crowding often took place from behind on the eruption of the third molars. And by removing the first molars in preference to bicupsids, allowance would be made for anterior and posterior crowding if the latter should occur. He could instance three mouths where the four bicupsids were removed for overcrowding, and in each case the third molars had erupted without trouble and normal in size. It might also, he thought, be remembered that the third molars were frequently diminutive in size, or did not erupt. Were we then jusiified in suiting the treatment to conditions which might possibly never arise?

Mr. Stirling, Ayr, said :—I have not very much to say,as I agree nearly with what Dr. Kingsley says on the subject. There seems to be a very prevalent opinion that the premature extraction of the temporary teeth will cause contraction of the jaw, or at least of the alveolar process. I do not know any good reason that has ever been given for that opinion, but I suppose those who adhere to it believe that the presence of the temporary teeth in the jaw does in some way influence the growing of the alveolar process outward and forward. When speaking of contraction of the jaw I suppose they mean, not contraction, because that is not the word for it, but a deficiency of forward and outward growth, or contracted, compared to what it would have been, if the temporary teeth had not been extracted. There might have been some truth in that, if the permanent teeth erupted and took position just in the places previously occupied by the temporary ones, but they do not; the permanent teeth, while growing, make alveoli for themselves, and do not grow into the alveoli of the temporary teeth. As regards the extraction of the temporary canine tooth, we must remember that in the jaw of a child of six years old, we have the crowns of the permanent lateral incisors and bicuspids near to each other, and the canine teeth, not between them, but lower down (in the lower jaw) and more forward. Now, when the first bicuspids are erupted just after the lateral incisors, it is reasonable to expect that we would have them rather too close together if we had not the temporary canine tooth to keep them separated. There is one condition, however, under which I would extract even the temporary canine teeth, and that is where the permanent lateral incisors erupt behind them, in the upper jaw, and inside the occlusion of the lower front teeth. In that case I think it better to extract the temporary canines and push the laterals out into place at once, than to wait for the eruption of the permanent canine teeth, when the regulating of the laterals would be certainly more difficult.

Mr. Macleod said: The question of the judicious and injudicious extraction of the temporary teeth is one which permits exercise of judgment, and will, I have no doubt, evoke difference of opinion among our members. Speaking generally, I have no hesitation in extracting offending temporary teeth quite irrespective of the immediate or tardy eruption of their successors. To this general rule I would decidedly make an exception in favor of retaining the canine, even at the expense of some pain to the little patient, or of threatened crowding of the incisors, until such time as its permanent substitute shall show active signs of eruption. I therefore occasionally extract the deciduous teeth to prevent irregularity; more frequently as the only available cure for toothache, and always when the tooth is the seat of abscess, not having yet found many little angels possessed of that sufficiency of wisdom and patience necessary to endure the protracted, not to say irksome, treatment necessary to induce a healthy resolution. I have no fear of contraction of the jaw resulting from premature loss of the temporary teeth. A case in illustration, similar to the one mentioned by Dr. Kingsley. Before coming to the meeting, I measured two spaces in the mouth of a child. The left central was shed a year ago, at that time there was no appearance of permanent successor, and only now is it showing signs of cutting; the right central is still in position, though slightly loose. The breadth of the two temporary teeth together measured four-tenths of an inch, the space between the laterals has now expanded to six-tenths of an inch. From the same mouth the first and second molars were extracted before the six-year-old appeared. The space between the six-year-old molar and the canine,measures six-tenths of an inch, the distance between the canine and molar on the right side (the temporary molars being present) is just the same.

We now come to the consideration of the permanent set. The only prominent question in connection with this is, which of the four teeth—viz. the lateral, first or second bicuspid, or first molar, should be extracted to make room for a crowded out canine. When I commenced practice, I, following the instructions of my preceptors, used to sacrifice the first molars; I have not done so for some years, as I found—1st. That if left to Nature alone the result was never obtained—2nd. That the wearing of a regulation plate, capping two or more of the teeth to prevent occlusion did not improve the teeth so capped ; and 3rd. The pulling back of the two bicuspids was troublesome to both patient and dentist, and not always satisfactory in point of articulation. I now invariably sacrifice the lateral or first bicupsid, as the circumstances may determine. A law cannot be laid down, in favor of either one or the other. Our own mother-wit, strengthened by experience, must guide our selection in each individual case, but of this I am certain, that the extraction of the first molar, after the bicuspids have articulated, wlll not allow the teeth anterior to it to travel backwards.

Here is a case which most emphatically bears out these views. The patient came to me three years ago, he was then a lad of fourteen years of age. Both canines were outside the arch ; he wished the back teeth removed; I advised the extraction of the first bicuspids. The first molar on the right side was denuded of its crown by caries, and abscess had formed at the roots, and I further advised its extraction for its own sake. I took out the bicuspid on the left side and the molar on the right side. He promised to come back in six months' time and have the right bicuspid out ; I saw no more of him till the other day, and these models show the result of the operation. The canine on the left side has fallen most beautifully into the place occupied previously by the first bicuspid. The canine on the right side is where it was three years ago, but the second molar has traveled forward the whole length of space of the first molar.

Mr. Amoore said he held the same opinion as that which Mr. Price had already expresssed with regard to the space gained by the extraction of two bicuspids. He believed that their removal in the mouth of a patient of fourteen or fifteen years of age relieved the crowded or overlapping incisors from additional pressure from behind, yet, as far as he knew, the elasticity of the lip was insufficient to draw them backwards and so utilize the space gained,which became filled up by the pressure forwards from behiud of the erupting second molars. He did not of course intend to say that the extraction of the bicuspids was useless to relieve pressure upon crowded and crushed incisors, but that the space so gained must be availed of by artificial means, and not left to nature, if the second molars were in the course of eruption at the time. In a regulation case, now under his treatment, the centrals were very projecting and overlapping, and to gain room, a sound first bicupsid on the one side and a decayed second on the other were removed. He had proceeded to draw in the prominent teeth without capping the molars, and the result was that in a short time the space was nearly closed, not so much from the bringing in of the teeth from the front, as from the pressure forward of the erupting second molar from behind.

Mr. Finlayson agreed with those gentlemen who had spoken to the order of the eruption of the permanent teeth, as laid down by Dr. Kingsley, and yet he thought it would be found that what the doctor said as to the canines being the last of the temporary teeth to leave the jaw, was very frequently departed from. He had found this to be the case in his own family. The canine teeth, both temporary and permanent, were certainly most important ones, and should not be removed except as a dernier ressort. The removal of the six-year-old molars, if at all decayed, was conducive to the health of the remaining teeth, and also to their spontaneous regulation, should they be out of place or if crushing or overcrowding existed. He had had several cases of regulation, where he removed the second bicuspids, and would not hesitate now to remove the first instead of the second ones, as a great deal of annoyance and time might thus be saved to the patient and to the operator, and with more satisfactory results.

He did not think with Dr. Kingsley, that it was immaterial whether the first teeth remain or not until the second ones show themselves. On the contrary, he had always found it otherwise; the jaw proper may go on growing, but the alveolar processes do not to the same extent, or in the same ratio. With regard to the other matter mentioned by the doctor—"Is it the pushing forward of the permanent tooth that compels the absorption of its temporary predecessor?"—he most emphatically adopted the affirmative view, and moreover thought that when a permanent tooth in coming to the surface missed its mark (*i. e.* its temporary predecessor), deflection of that permanent tooth from its proper course was the inevitable result. The removal of retained temporary teeth, at or near the age of manhood, is and must always be a doubtful proceeding, as the alveolar processes then become dense and rigid. The regulation of teeth has often been discussed, and while agreeing with Dr. Kingsley as to the advisability of retaining the canines, thoughtful judgment must be the guide, in conjunction with experience of other cases, as each must be treated for its own requirements.

The President said he regarded the retention of the deciduous upper canine as of the greatest importance, and had no doubt but that it was due to its premature removal that the hopeless case of which he showed the model—(transposition of canine and lateral)—was produced. The same explanation would also apply to a case which he had brought before the Society some years ago, in which (the lateral incisors being suppressed) the canines came in between the bicuspids.

He did not place any special value on the lower canine, as while in the upper jaw they had the crypts of the permanent lateral and first bicuspid in actual contact, (that of the canine being on a higher level), in the lower jaw the crypt of the canine was interposed, so that the removal of the lower temporary canine, as spoken to by Mr. Price, was quite likely to answer his purpose with little risk of harm.

The increased space required by the larger permanent incisors is gained in the upper jaw by these teeth being less vertical in direction than their predecessors.

He considered that Dr. Kingsley did not place sufficient value on the retention of the temporary molars, and more especially the second. These occupied a much larger space than the bicuspids which replaced them, and the surplus would naturally go far to assist the canines, if the permanent molar was allowed time to become a fixture before their removal; otherwise the space was lost.

As to those cases in which a temporary tooth firmly retained its position beyond the normal period, and there was no symptom of the presence of its successor, he declined to remove it. He had seen cases in which deciduous canines and second molars were doing their duty well, thirty years after they should have been shed.

Turning now to the removal of sound permanent teeth, he objected to the removal of the canines, unless under very exceptional circumstances, preferring to remove the first bicuspids or even the lateral incisors, to make room for irregularly placed canines. He quite agreed with Mr. Macleod as to the little room gained for the teeth in front by the removal of the first permanent molars. There was undoubtedly a gain by their removal about the age of twelve, if much decayed, as improving the position of the posterior molars.

He did not believe in the idea that the removal of the temporary teeth was likely to lead to contraction of the jaw, the presence of the crypts of the permanent ones preventing it.

As to the dependence of the development backward of the jaws on the molar germs, they had been told that in cases where these were suppressed, the jaws retained the form and size as in childhood.

The separation which normally took place among the temporary teeth, he referred more to a moving outwards of the teeth, thus widening the curve, than to any interstitial growth of the jaw.

He passed round the model of a lower jaw, showing on both sides an irregularity not noticed by Dr. Kingsley, the cause being in his opinion the premature removal of the first permanent molars. They would see that a wide diastema existed between the bicuspids, the second having evidently come to the surface, behind the temporary molar, which tooth had most likely retained its place long after the normal time.

He had much pleasure in thanking Mr. Price for having taken the initiative in what had been to him a very pleasant discussion. —*Journal British Dental Association.*

REMARKS ON THE NATURE OF CHANGES WHICH OCCUR AFTER THE EXTRACTION OF THE NATURAL TEETH, AND THE PROPRIETY OF EARLY INTRODUCTION OF ARTIFICIAL SUBSTITUTES.

A paper read before the Cincinnati Dental Association.

BY PROF. J. RICHARDSON.

In a brief period after the extraction of the teeth, inflammation, of a higher or lower grade, is established, accompanied with some degree of tumefaction and tenderness in the parts implicated. If the inflammation is moderate in degree, and is permitted to run its usual course, it will be entirely consistent, in its ultimate consequences, with the requirements of the economy. If immoderate in degree and long continued, the natural processes or actions in the parts, determining the various changes which take place, will be more or less diverted or embarrassed.

The immediate issue or product of the inflammation which occurs is fibrinous exudation from the ruptured surfaces of the periosteum of the socket, which, in its incipient stage of organization, takes the form of granules. In from ten days to two weeks, the socket is partially or entirely occupied with the fleshy substance. During this period, the actions are directed almost wholly to *reparation.* Absorption does not, ordinarily, occur until the inflammation has, in a great measure, subsided, and hence, at first, there is enlargement or tumefaction of the gums, rather than waste by absorption. As the inflammation subsides, however, these parts, which have no longer any special functions to perform, as the more protuberant portions of the alveoli and adherent gum, begin gradually to waste away under the action of the absorbents. Concurrently with this absorption there is deposition of osseous material within the socket through some agency of the granules filling it, so that, in course of time, the cavity is partially filled in with bone analogous in structure whith the maxilla proper, of wich it ultimately forms a part; while the more superficial portions of the granular formations are transformed into tissues identical with the soft structures immediately surrounding. It is in this manner, by the concurrent and co-operating actions of absorption and deposition, that the maxillary ridges attain ultimately the smooth, regular and symmetrical form noticeable when the changes are completed.

In view of the facts just advanced, the inquiry suggests itself, how soon after the extraction of the natural teeth may artificial appliance be introduced into the mouth consistently with the conditions at first existing, and the integrity of the new formations?

We are amongst those who believe that the best interests of the patient require the early introduction of artificial substitutes, in all cases demanding full dentures. By so doing, we are enabled to confer immediate and signal benefits, by preserving, in a great measure, the customary expression of the individual—promoting easy and distinct enunciation—assisting in the more perfect comminution of food, and by maintaining unchanged the habitual relation of the jaws. The very general recognition of these important advantages has led to great unanimity of opinion in regard to the propriety and necessity of inserting what are termed *temporary* sets of artificial teeth.

More recently, the policy of inserting artificial teeth *immediately* after the extraction of the natural organs, is being advocated. Although the practice is seemingly heoric and hazardous, the reasons for its adoption are plausible. It is claimed that the inflamed parts, being shielded by a perfectly adapted plate, are less subject to injury in munching food than when uncovered, the pressure in the former case being distributed over a larger surface, thereby equalizing the forces applied to mastication. Some good is doubtless accomplished in these cases, by protecting the wounded and inflamed structures from the irritating action of the atmosphere and from sudden and direct impressions of extreme heat and cold.

On the other hand, it is held that the pressure of the base upon, and contact with, abraded surfaces already inflamed and sensitive, can not fail to aggravate existing morbid conditions. If such be the case, the practice may fairly be challenged; for any mode of procedure that would tend to increase the inflammation unavoidably present after the extraction of the teeth, or that would serve to extend it beyond the period of time when it should spontaneously subside, or that would interrupt, in any considerable degree, the reparative processes going on within the socket, is clearly inadmissable. Observation has fully confirmed us in the belief that active inflammation in the structures about the sockets retards absorption, and delays the completion of those changes which it is important should occur at the earliest period consistent with the natural operations of the economy. We have frequently noticed, as we have no doubt all have who have given the subject attention, that in cases where even moderate inflammation of the parts, either from local or constitutional causes, has continued long after the usual period for its subsidence, little or no absorption has taken place. As well as we can remember, all of those cases of unusual tardiness, where the gums have remained almost wholly unchanged for a period of several weeks together, inflammation of a somewhat intractable character was found present, the gums remaining somewhat turgid, with diffused redness and some tendernes on pressure. Whether the causes operative are systemic or local, the condition manifestly opposes the action of the absorbents, their functions, for the time being, resting apparently in abeyance.

Our experience does not justify us in expressing a positive opinion as to the propriety or impropriety of inserting a plate at the earliest possible period after the removal of the natural organs. If solicited so to do, we should have no hesitation, after having extracted the teeth, in taking the impression during the same sitting, and proceed with the operation at once, although it has been our usual practice to defer it until the more active stages of the inflammation, and the soreness consequent thereon, had, in a great measure, subsided.

In all cases, where the substitute is applied at an early period, the cavities in the model, corresponding with the sockets of the teeth, should be filled up even with the surface of the ridge, that the plate when made may not project into the sockets, and prevent, by mechanical obstruction, the normal development of the granular formations, which are essential to the integrity of all the parts, and which can not be interrupted in any considerable degree without influencing the ultimate form of the jaw. It is in this manner that irregularities on the surface of the ridge are often produced, and not, as is erroneously supposed, by mere *pressure* of the base, the inequalities on the surface of which produce corresponding impressions upon the ridge.—*Items of Interest.*

ON LIGHT.

To the Editor of the Dental Practitioner.—DEAR SIR: I have been very much interested in the article by Dr. Faught, on Light.

Will you permit me to make a few suggestions to your readers which I have found of great value to myself.

I use a south light, because I believe that any one who is obliged to be in-doors all day should work in a room into which the sun can shine. It seems to me, therefore, that the operating room should have at least two windows. Through one of them the sun light should have unimpeded flow. The other I arrange in this manner: Outside of the window where the operating chair stands is a corrugated silvered reflector, three feet square; this takes the light from the south and reflects it into the room where it strikes another plain mirror of the same size, which is hung on pivots above the operating chair. From this second mirror the light is thrown directly down on the patient. As the patient sits in the chair he cannot see the outside reflector, because a green curtain is drawn up from the lower part of the window about two feet. To save the operator's eyes, another small green curtain is hung from the rear edge of the outside mirror (the one above the operating chair). This shuts off all light from the window which otherwise would strike the operator's eyes, but allows all the light to enter the patient's mouth.

To still further protect the dentist, the light from the second window, into which the sunshine is always allowed to come, is prevented from reaching the chair by a screen about seven feet high which stands at the left of the chair. This screen is of a dark color, as are the carpets and walls of the room. The injury to the eyes does not come from the strong light before which most dentists work, but from trying to see into the mouth after looking at this strong light. The accommodation of the eye is strained and disease of the retina follows in time. Being obliged to use my eyes many hours each day, I have tried several ways of regulating the light, and find the one I have just described very good, particularly when it is supplemented, on very dark afternoons, with a reflector like Beseler's stomatoscope, to which, however, a blue glass, ground and greased, should be added, for the light to shine through before it is reflected by the concave mirror.

Yours sincerely,

BOSTON, Jan. 29, 1884. WILLIAM HERBERT ROLLINS.

TRANSLATIONS.

PROPORTION OF CHLOROFORM IN THE BLOOD OF AN ANÆSTHETIZED ANIMAL.

Messrs. Gréhant and Quinquaud have just given to the Academy of Science, a communication from which it results that the anæsthetic dose of chloroform is 1 gramme (23 English grains) for two litres of blood.

Multiplied analyses have equally shown that the fatal dose is exceedingly near the *anœsthetic* dose. These results give one of the reasons for which the administration of chloroform is dangerous.

The fundamental principle of the method rests: 1st. Upon the distillation of the blood in the void, permitting the chloroform to obtain in solution or in vapor. 2nd. Upon the property that the latter possesses of reducing in an indirect manner *cupro potassique* liquid when its acts at the temperature of 100°.

In order to attain this object, it suffices to extract the anæsthetic agent by the distillation of the blood; to submit a known quantity of distilled liquid, (reunited to the liquid washing (*lavage*) of the gas), to the action of heat in presence with such a volume of Baresewill liquor that the latter may be reduced with no excess of either chloroform or liquor. Comparing afterwards the quantity of discolored liquid to that which a definite quantity of chloroform reduces in solution, one arrives, by a simple proposition, at the knowledge of the quantity of the chloroform contained in the reunited liquids, and therefore the proportion that a given quantity of blood encloses. For the details of the experiment, see the reports of the Academy meeting of Oct. 1st, 1883.

—*Journal Spécial.*

NEW PROCESS OF ANÆSTHESIA BY CHLOROFORM.

M. P. Bert: I have received from Mons. Peyraud (de Libourne) a note designed to make known a process of surgical anesthesia which seems to confirm the results that I have obtained with the dog.

M. Peyraud pours on the compress placed at the nostrils only a single drop of chloroform and renews this dose at each inspiration exactly. He thus obtains the anæsthesia without the patient manifesting the least sign of excitement.

The author relates, in support of his practice, a great number of observations. I will cite a few.

With a woman, who had broken the patella of the knee insensibility was complete at the end of seven minutes, and to obtain it only six grammes of chloroform had been absorbed.

A child of five years of age (coxalgique) was put to sleep with 3 grammes.

Another woman, with cancer of the breast, had not been able to fall asleep under the ordinary processes of chloroforming, on account of cardiac and respiratory troubles resulting from it. M. Peyraud effected insensibility by his process without provoking any reaction with eight to ten grammes of chloroform. Sixty grammes administered in the old way had given no result several days before. The operation and dressing of the wound lasted one hour and a half, the expenditure of chloroform was only twenty-five grammes. Anæsthesia obtained. In order to preserve it, it sufficed to breathe the chloroform as I have indicated, only at intervals sufficiently long.

One remembers that with the dog, a mixture of ten grammes of chloroform for 100 litres of air may be breathed during about two hours without causing accidents. I have concluded from this that if one wishes to apply this process of anæsthesia to man, it would be necessary to employ a mixture near to that for the dog.

It appears from the work of M. Peyraud that this mixture might be carried to twelve grammes.

It is not astonishing that the tolerance of a man for chloroform may be a little more considerable than that of a dog.

—*L' Odontologie*, January, 1884.

JOURNALISTIC.

"Reading maketh a full man; conference, a ready man; and writing, an exact man."

The British Journal of Dental Science, for January opens with "Statistics Showing Which Teeth Should be Extracted in Crowded Dentures Where Expansion is not Practicable," a short article by

Percy May, M. R. C. S., but one showing the result of a great deal of work. He believes that the first molars are the teeth to extract. He gives a table including 7,277 upper and lower teeth that were treated, of these there were 2,823 first permanent molars, 757 first bicuspids and 944 second bicuspids, these teeth were in the mouths of persons of all ages. He also gives a table showing the per centage of decay under fifteen years of age:

First molar	68¼ per cent.
First bicuspid	7 "
Second bicuspid	8¾ "
Lateral incisor	3½ "

He bases his conclusions on the fact that the first molars are the most prone to decay.

Dr. Jos. A. Brown, Glasgow, believes that the use of brown (wheaten) bread is conducive to the growth of the teeth, as it contains one per cent more bone matter than white flour. Dr. J. J. R. Patrick's "Civilization not the Cause of Tooth Decay" brought forth the above remarks.

J. J. Musgrove, L. D. S., gives us a short article on, "Trismus Dentium," he having had several cases, partial and complete, in his own practice, in fact, two of partial closure of the jaws through difficult eruption of the lower wisdom teeth, within the last fortnight, which he relieved by forcing the mouths open, under the influence of nitrous oxide gas, and removing the teeth with "Physick's Elevating Forceps" (these he has found in over twelve years' of use to be invaluable in the extraction of frail wisdom teeth). We can bear witness to the value of these forceps.

Dr. John J. R. Patrick's article on, "Civilization Not the Cause of Tooth Decay" is concluded in this number.

Dr. A. Werner in "Practical Hints to Dentists" gives the following: "In order to set artificial teeth with a natural appearance one must first place the two great incisors straight, or the least bit inclined to one another, then the small incisors leaning somewhat inwardly, afterwards the canine teeth projecting outwards, both in the lower and upper jaw. The form of the teeth is scarcely ever altered, however irregular they may stand. The central incisors are often longer than their neighbors, and the eye teeth must be longer than the lateral incisors. If the appearance when finished should be somewhat unpromising, it will be found when placed in the mouth that the irregularities will seem much less remarkable." * * * "Beginners must at first expect much criticism from the public, but will eventually find most people are thankful to have a natural looking set of teeth." * * * and he is the best artist whose teeth atttract the least attention." We commend the above and hope all beginners may give it their thoughtful attention and profit thereby.

A WARNING TO THE PROFESSION, by Dr. A. W. Freeman, is a history of how he lost his right leg. He says: "I had taxed the knee for years with the entire running of Green's, then White's, dental engines, often with a feeling of discomfort which it was supposed was rheumatic. Dr. J. F. Marriner, of Ottawa, Ill., says the running of the engine has seriously affected his knee. Dr. W. O. Kulp, of Davenport, Iowa, was laid up two weeks from inflammation of the synovial membrane, caused by use of the engine." * * * "A water motor, electricity, or an assistant should run the engine." * * * "In retrospect, says Dr. Freeman, I now consider that the many thumps and the running of lathe and engine for over twenty years were preparatory aids, while the immediate cause of the primal inflammation of the knee was the severe blow, upon the crank of a Morrison dental chair, given a few hours before twinging pain began." Every dentist should heed this warning.

The London Lancet, of January, contains an interesting article on "Emetics for Bones in the Throat" by Dr. Glover. He says: "It is curious that in several of the best text-books on surgery, among the means used for dislodging bodies in the throat no mention is made of emetics." As an emetic he prefers half a drachm of sulphate of zinc in warm water the more water the better and safer. "In case the patient cannot swallow, apomorphia may be safely used hypodermically."

Dr. A. N. Roussell gives his thoughts regarding "The Use and Abuse of Gold as a Filling Material." He says, "The first consideration which presents itself to the intelligent judgment of the dentist, when he is about to fill a tooth, is, what is the best material to use for the purpose" * * * "Any devitalized tooth requiring two books of gold to fill it, or rather to build it into the semblance of a tooth, is not fit to fill; it is a case for an artificial substitute, and there is nothing so thoroughly indicated as a good tooth crown, either of gold or porcelain. * * * For anterior teeth, where not more than a third or a quarter of the crown is left, either latitudinally or longitudinally, cut it off and attach a porcelain crown, and you will have a result that will never be attained with a gold plug."

The Dental Record, London, January, contains "Notes for Students" by the editor. He gives advice as to the treatment of patients. A table, giving the common causes of toothache, what due to the symptoms and treatment, is a part of the notes.

He says: "Whenever it is possible let a napkin intervene between your fingers and the lips and, face of the patient." * * * "Particularly when using instruments, such as the excavators and the engine ; do not permit the metal to touch the lips. To use a small napkin, neat and clean, in this way is not only more pleasant to the patient and to your own feelings but it also, in a great many instances, increases the amount of light reflected into the mouth." * * * Cultivate delicacy of manipulation, a light touch, and avoid pounding in the mouth." "Be candid and truthful to your patients. Do not say "I shall not hurt you," when the very next movement, you, it may be intentionally, come in contact with a living pulp or some sensitive part.

Particularly with children is such practice to be deprecated, for every time their confidence in you is broken does the difficulty in managing them increase." * * * "Gentleness, kindness, truthfulness, persuasiveness, and, at the same time, firmness, are compatible with producing the best work, while these qualities inspire confidence and assistance on the part of the patient—valuable aids not to be despised,"

A large part of this number is devoted to reports of different associations.

January number of *The New England Journal of Dentistry* opens with "Concerning Records," by Dr. Geo. L. Parmele. The plan which he has adopted is an adaptation of the card catalogue system now in use in most libraries. The cards cost $1.75 per 1,000, and may be procured of Mr. Davidson of the Library Bureau, 32 Hawley street, Boston, who has kindly offered to furnish cards with diagrams of teeth on them.

The Journal of the British Dental Association begins with an editorial on Unsolved Problems in Dental Science given "merely to indicate a few of the many questions admitting of complete solution, which are as yet quite unanswered."

1. The exact nature of the degeneration which has taken place in the durability of teeth."—Is it a fact that teeth have degenerated? Recent investigations contradict this theory. Let us have facts.

2. The action of the various agents in ordinary use as dressings upon odontoblast cells."

3. The origin of inflammation about the roots of dead teeth."

4. The duration of phosphate fillings."

The editor has also some good advice under the title "To our Readers and Critics." He says: "The most common request is for more news.' In regard to this we are very much at the mercy of our readers. We cannot manufacture news; it must be supplied us and there are few of our readers who cannot, at sometime or other, thus assist in increasing the interest of the *Journal*."

He says: "If the *Journal* is not as it should be, why then go to work and do what you can to improve it, instead of contenting yourself with expressions of censure."

Dr. J. L. Williams continues a consideration of the merits and claims of artificial crown and bridge-work in the *Dental Cosmos* for January, illustrated. First case.—The four superior incisors on the roots of the centrals. This will do very well, we think, but when we come to putting the six front teeth on the roots of the canines, the practice becomes doubtful.

Dr. Stewart J. Spence gives his experiments with celluloid and the New-mode Heater. He made over thirty experiments and judging from his results it requires a great amount of care and then the results are not very satisfactory.

ACONITE. By Dr. Geo. A. Mowfield. This medicine is used successfully by dentists as a local remedy. In the early stages of inflammation about a tooth it is a powerful abortive remedy, it is also an active poison and should not be used by any one ignorant of its characteristics, and only used with caution. In pericementitis apply it to the affected part by moistening a piece of cotton with the tincture and allowing it to remain on the gums a few minutes. If congestion has occurred, scarify the gums, allowing them to freely bleed, then apply the aconite. Aconite is also applied to inflamed pulps. An excellent combination is equal parts of chloroform, tincture iodine and aconite tincture. Two drop doses of the officinal tincture (always in water) every twenty or thirty minutes until eight or ten drops have been taken will generally relieve fever and neuralgia. The editors say: "We are sorry to learn that the MISSOURI DENTAL JOURNAL will cease to exist with the December number. * * * "That the 'West' should let it die 'for want of support' does not speak so well for that section of country as we could wish." We are glad that his sorrow was of short duration and thank him for his kind words.

The American Journal of Dental Science contains four articles and an editorial. Article I. "Personal Identity Established by the Teeth ; The Dentist a Scientific Expert," by Dr. Richard Grady.

The doctor contends that DENTAL JURISPRUDENCE should have not only "a name but a local habitation," and gives a number of cases in which the teeth served as almost the only clew to the identity of the person in dispute, and in no case did these proofs fail.

Article II. "Treatment of Fractures of the Jaw, with critical remarks, as sent to Prof. D. Hayes Agnew, M. D. By Dr. Thomas Brian Gunning.

The object of this article, is to present the author's method more clearly to Prof. Agnew and others. It appears that Prof. A's work: "The Principles and Practice of Surgery" does not clearly set forth Dr. G's method.

Article III. "In defence of DR. E. C. BARNUM," by Dr. G. A. Mills. His is an unfortunate selection of a title as DR. BARNUM—with capitals—needs no defense, unless it was a crime to invent the rubber dam. It's too "coffer dam" thin but the mills (G. A.) of the gods grind slow, but exceedingly fine.

Article IV. "Dies, etc.," by Haskell, Chicago. He goes for a critic who uses "hydrated calcium sulphate." Dr. Haskell's article was copied extensively, no doubt all have seen and read it.

We have discarded the use of oil for mixing with sand, prefer water in ours.

We were also disappointed in the metal ; makes a good fit, but is very brittle and soon becomes "mushy." Perhaps the metal was not up to the standard.

The dentists' of Maryland have two bills before the legislature of that State providing for an examining board.

The dentists, of course, are divided. We had the same difficulty in Missouri, but now all is serene and no one can enter the State to practice dentistry unless he or she is a graduate of a reputable dental college.

The Southern Dental Journal continues Mrs. M. W. J's "Letters from a Mother to a Mother on the Formation and Care of the Teeth." Every mother should read these letters. We understand that these letters are to be published in book-form. The editor has an obituary notice of THE MISSOURI DENTAL JOURNAL. He says: "No profession ever had a truer exponent; no profession a worthier representative. As a contemporary, we were always glad when the time of its coming was at hand." Here we are again under a new name but hope that we will gladden his heart just the same.

"A New Method of Filling Teeth," is the first article in January number of the *Ohio State Journal*. The method is given to the profession by Herr Zahnartz, W. Herbst, Bremen. Only the whole article would give an idea of this method, extracts would be useless. Dr. M. H. Chappell concludes his article, "Best Means of Preserving the Teeth" with "After your work is completed, exact a promise from your patients that they will pay thorough attention to brushing their teeth, and return for examination not longer than once every three months." Say twice a year.

H.

MISCELLANY.

POISONING BY BORACIC ACID.

The increasing employment of boracic acid as a topical application gives interest to the following communication from Dr. Molodenkow, of Moscow (*Cbl f. Chir.*).

The first case was that of a man of twenty-five, who, after thoracentesis, was treated by washing out the pleural cavity with 5 per cent boracic acid water, the operation lasting an hour, and fifteen quarts of the boracic acid solution having been employed, a portion of which remained in the pleural cavity. Vomiting, weakness, with increase of pulse and temperature, and later an erythematous eruption upon the face followed. Within a day or two all these symptoms grew worse, the erythema spread over the body and thighs, mother-of-pearl-like vesicles appeared over the face and neck, vomiting continued, weakness increased, hiccough and dimness of vision; finally, death on the fourth day.

The second case was that of a patient sixteen years of age, suffering with an abscess in the region of the hip, which was washed out with 5 per cent boracic acid water, a portion remaining in the cavity of the abscess afterwards. Within a quarter of an hour uncontrollable vomiting began, and the patient died of exhaustion on the third day. Boracic acid cannot, therefore, be regarded as an indifferent substance—at least when introduced into the cavities of wounds.—B. H. J.—*U. S. Medical Investigator.*

UNIVERSITY OF MARYLAND DENTAL DEPARTMENT.

The Annual Commencement of this Department was held March 13, 1884 at the Academy of Music, Baltimore.

After the reading of the mandamus, the names of the graduates were announced by the Dean, Prof. F. J. S. Gorgas.

The degree of "Doctor of Dental Surgery" was conferred upon following gentlemen by Hon. S. Teackle Wallis, L. L. Provost of the University:

Theodore W. Albright,	New York.
James B. Bigham,	South Carolina.
Charles B. Blubaugh, M. D.	W. Virgina.
Wilber C. Bressler,	Pennsylvania.
Henry W. Boswell,	Maryland.
John H. Brown,	Ohio.
George Butler, Jr.	New Jersey.
J. M. Comegys,	Tennessee.
George V. Copp,	Virginia.
Almond J. Cutting,	Massachusetts.
Isaac H. Davis,	Maryland.
Watson E. Dorcester,	New York.
Richard D. Evans,	S. Wales, G. B.
Claus Henry Filter.	Germany.
Nathan E. Foote,	New York.
Frank C. Gallup,	Connecticut.

James Edwin Harris,	Maryland.
S. Dwight Hodge,	Vermont.
R. Dallas Kibler,	Virginia.
Wiley S. Killingsworth.	South Carolina.
Charles J. Ladson,	District of Columbia.
Clarence E. Lemley,	Virginia.
William Edward Lewis,	Florida.
Job B. Mallott,	Pennsylvania.
Charles H. McDowell,	North Carolina.
Semoney J. Minghin,	West Virginia-
S. Latimer Phillips,	Virginia.
George Edward Purnell,	Maryland.
Nelson T. Shields,	Texas.
A. La Fayette Stratford,	North Carolina.
Reading B. Swindell,	North Carolina.
John E. Taggart,	Vermont.
Robert R. Vaughan,	Missouri.
Richard van der Hoppe,	Austria.
Joseph T. Wayman,	Virginia.
Elmer J. Wisherd,	Maryland.

The valedictory address was delivered by Hon. J. Randolph Tucker, member of Congress from Virginia.

The number of Matriculates for Session of 1883—84 was 86, all of whom were purely dental students.

MAD RIVER VALLEY DENTAL SOCIETY.

The Mad River Dental Society will hold its annual meeting in the parlor of the Phillipps House, Dayton, Ohio Tuesday May 20, 1884.

Sessions begin at 10 o'clock, a. m., 2 and 7 p. m.

SUBJECTS FOR DISCUSSION.

1. The Value of Pulpless Teeth and Roots.
2. Inflammation.
3. Alveolar Abscess.
4. The Promotion of Osseous Development.
5. Facial Neuralgia.

President, A. Berry, Cincinnati; Vice-President, C. M. Wright, Cincinnati; Secretary and Treasurer, W. H. Sillito, Xenia.

IOWA STATE DENTAL SOCIETY ANNUAL MEETING.

The twenty-second annual meeting of the Iowa State Dental Society will be held in Council Bluffs on the first Wednesday in May. Officers : President, E. E. Hughes, Des Moines ; Vice-President, T. M. Shriver, Glenwood ; Secretary, J. B. Monfort, Fairfield ; Treasurer, J. S. Kulp, Muscatine.

Executive Committee—W. P. Dickinson, G. W. Fuller, H. A. Woodbury.

Membership Committee—S. A. Garber, L. E. Rogers, A. R. Begun.

Every effort is being made to make this meeting interesting and profitable. Those attending will be returned at one-third fare over railroads.

J. B. MONFORT,
Secretary.

BIBLIOGRAPHIC.

VULCANITE AND CELLULOID ; INSTRUCTIONS IN THEIR PRACTICAL WORKING FOR DENTAL PURPOSES. By S. Eldred Gilbert, D. D. S. The S. S. White Dental Mf'g Co. Philadelphia, 1884.

This work is devoted to a detailed description of the successive steps in the processes of making artificial dentures in vulcanite and in celluloid, from the taking of the impression to the completion of the denture.

Temperaments are considered in the selection of artificial teeth, and some useful directions given relative to arranging them in position.

The tables contained in Prof. Wildman's work on "Vulcanite" are quoted, to show how rapidly the pressure of steam increases at high temperatures.

Articulation, waxing up, packing, separating the flasks, finishing, the use of metallic clasps, repairing, etc., etc., are very fully set forth.

For the working of celluloid the glycerine machine, the "Best" hot air apparatus and the "The New Mode Heater" are described and illustrated. The book contains numerous illustrations and very completely covers the subject-matter of which it treats, and consequently will be a valuable aid to the dental student, for whose use it is mainly intended.

PAMPHLETS.

Merits and Claims of Crown-and Bridge-Work. By Dr. J. L. Williams, New Haven, Conn. Reprinted from the Dental Cosmos.

Closure of the Jaws, and Removal of a Tumor, Two Essays delivered before the Illinois State Dental Society. By John J. R. Patrick, D. D. S., of Belleville, Ill.

Micro-Organisms, the Essential Factors in Dental Caries, by C. T. Stockwell, D. D. S., of Springfield, Mass. Reprinted from the New England Journal of Dentistry.

Treatment of Fracture of the Jaw; with Clinical Remarks, as sent to Prof. D. Hayes Agnew, M. D., by Thos. Brian Gunning, D. D. S., of New York.

EDITORIAL.

The etiology of dental decay, has of late become a most prominent subject of discussion in dental societies and journals.

Much light has been thrown upon this hitherto very obscure problem, and many facts have been established, which must be taken into the account in the future consideration of this question. The chemical, or acid theory of decay, so long held, almost universally, has received some pretty hard knocks, so far as this theory relates to the decay of dentine. There seems now to be little doubt that micro-organisms are an essential factor in the destructive processes which take place in this tissue. Yet in the case of enamel the chemical theory has not lost much of its former prestige, but still holds a strong ground of probability.

The present attitude of the question is about this; fermentation takes place in food substances, by reason of the presence of micro-organisms. Acids are the product of fermentation, and the fermenting food substances being in contact with, or in close proximity to the surfaces of enamel the acids generated therein,act chemically upon the lime salts of the enamel, and first the softening, and then the destruction of the enamel follows. This destruction of the enamel, or possibly also its softening, opens the way to the entrance of bacteria and other organisms, and gives access to the dentine. A similar condition exists where enamel fissures extend entirely through that tissue.

The main point in dispute is, do these minute organisms cause decay of the dentine, unassisted by the chemical action of acids? It is manifest that the accumulation of food substances increases, in proportion to the greater capacity of the cavity of decay; and that the generation of acids, keeps pace with the increased fermentation consequent upon the greater accumulation of food in the enlarged cavity. There is therefore no lack of materials for the production of acids proportionate to the increased area to be acted upon. There are probably acids enough produced to cause all the mischief, but, is the mischief done by the acids? That is the question. We are told that decayed dentine has lost little or none of its lime salts, and if this is so, what becomes of the chemical theory so far as it relates to the decay of dentine?

It cannot be denied, that the more highly organized structure of dentine, as compared with that of enamel, favors the operations of bacteria and similar organisms; and also that the density of enamel, and its near approach to an absence of organic matter, presents an exceedingly unfavorable condition for such operations. It seems pretty clear that the initial act in dental decay is the decalcification of enamel by action of acids, and that this is a condition precedent to the formation of a cavity. It is not clear that this process continues after reaching the dentine, although acids may be and no doubt are, constantly present in the cavity. It may be said that the components of the two tissues, enamel and dentine, are too nearly alike to admit of a probable difference in the processes by which they are destroyed. But if it is shown, beyond a doubt, that the normal proportion of lime salts remains in decayed dentine, we are driven to the conclusion that the processes of destruction *are* different and we must conform our theories to the demonstrated facts.

For our better knowledge of this subject the profession are chiefly indebted first to Messrs. Underwood and Milles, of London, and subsequently, and more in detail, to our fellow-countryman, Dr. Miller, of Berlin. Great credit is due to these gentlemen for their untiring labors in this most difficult line of work; yet we hope their efforts will be continued, until all doubts are removed and the nature of dental decay is clearly established. SIGMA.

THE

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SALIVARY CALCULUS AND ITS REMOVAL.

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Read before the Illinois State Dental Society, May, 1883.

The quantity and color of salivary calculus, or tartar, as it is generally called, varies in different temperaments, and the general state of the health exercises a great influence in each case. Phosphate and carbonate of lime are its principal ingredients. A small quantity of animal fat also enters into its composition, and the relative proportions of its constituents vary according as it is hard or soft, or as the temperament of the individual from whose mouth it is taken, is favorable to health or otherwise; hence it is that the analyses that have been made by different chemists differ. Nearly all persons are subject to deposits of salivary calculus, though not all alike. In some cases it collects in large quantities, and less so in others; its characteristics, both chemical and physical, are exceedingly variable. At times it is composed almost wholly of one ingredient, at other times of two or three. Neither is it always of the same color. In one case it is black, at other times dark brown, and again nearly white, It differs greatly in density. The black is hardest, the white softest. There are two kinds of tartar, both called black, but differing in many particulars. One kind is most generally found in the mouths of persons whose physical powers have been reduced by disease, intemperance. etc.

It is found in quantities near the salivary ducts, firmly adhering to the teeth, and its removal is accomplished with considerable difficulty. It is very black, and is covered with a very offensive mucus.

This form of salivary calculus is attended with villainous consequences, not only to the gums, alveolar processes, and teeth, but to the general health. It causes the gums to inflame, suppurate and recede from the necks of the teeth, in some cases uncovering the root on one side its entire length. It grows constantly; it creeps, insinuates, causing death and destruction until the support is entirely destroyed, causing the tooth or teeth to fall out.

The secretions of the mouth are bad and rendered unfit to be taken into the stomach.

The brown tartar is less hard, and is found in large quantities on the lower front teeth, and also on all teeth, but in less abundance.

Its removal is accomplished more easily than either of the other varieties The effects of this are less injurious than that of the last noticed, yet in many respects like it. It also causes the gums to inflame, swell, suppurate and recede from the teeth, destroying their support until they loosen and drop out.

Salivary calculus of a pale brown color is of a consistency much softer than either of the dark varieties, and is removed easily, but its effects are quite as disastrous as any other.

White tartar seldom accumulates in large quantities; it is very soft, causes but little irritation, but is by no means harmless, as it corrodes and causes rapid decay of the teeth.

There is a sort of parallel between salivary and urinary deposits. We may have a deposit of lime salts whenever and wherever these salts exist in a fluid under certain conditions. A familiar example is the coating in the tea-kettle where hard water is used, an illustration that may be very properly employed for the instruction of our patients. These salts exist in saliva, and are either deposited or remain in solution. There is a variance as to quantity present in different individuals, and at different times and circumstances in the same individuals. These differences are modified by constitutions, habits, modes of life and exercise. They are increased in quantity by hard labor, and are kept in solution partly by motion.

Deposits are favored in various ways: first, as the point of saturation is neared; second, as fluid loses motion; (the stillest place in the mouth is under the tongue in front, adjoining the lower incisors; there is a constant flow between the cheek and posterior molar above); third, by rough surfaces, such as half-cleaned enamel, fourth, foreign substances; salivary calculus forms readily wherever any body exists for a nucleus; and last, mouths that are allowed to remain in a dirty condition, with particles liable to lodge next the gums or between the incisors below, are in every way extremely favorable to deposits.

And now as to remedies. As I understand it, they can nearly all be summed up in one word, viz., CLEANLINESS.

I have little faith in any so-called constitutional treatment. In ninety cases out of a hundred the teeth must be cleaned and kept as nearly so as possible by the combined effort of dentist and patient. Cleaning and polishing the teeth is an operation that cannot be performed at one sitting. It ordinarily takes two, and in some cases will require three or four. Nor is one operation of this kind, be it ever so thorough, going to answer for all time, or during the natural life. It must be done again and again, yearly, semi-yearly, and oftener if necessary. The idea is, keep them clean. If once a year will accomplish the work, all right; but keep them clean, if it has to be done every month in the year.

It is a notorious fact that the operation of removing salivary calculus and other deposits from the teeth, thoroughly cleaning and polishing them, is neglected oftener than any other in the line of our duty as dentists. And there are several reasons why this is so. Among them are ignorance, laziness, want of proper instruments with which to do this work, and the small amount paid us for such operations. Ignorance and laziness may sound harsh in this connection, but however much we may dislike the sound of it, it is nevertheless true. And as to instruments, I think I am correct in saying that there exists a great deficiency in this line. You would be surprised to see and know what kind of instruments many of us are using for this most important work. Why, some of them look very much like clam diggers, and are quite as well adapted for that work. And then we are poorly paid for this work, and there are several reasons also for this, one of which is that we, as dental advisers and teachers, have as yet failed to impress its importance upon our patients. Teach them its value, show them that upon *this* rests the success of every other operation performed in the mouth.

Teach them this at the outset, the first sitting, which can be easily accomplished if we will but take the trouble. Intelligent patients take our advice and explanations kindly, and, when understood, readily submit to and acquiesce in our judgment. A proof of this is their readiness to endure both pain and inconvenience and willingness to pay for the work.

I say we are poorly paid, another reason for this is, our patients do not, as a rule, understand its importance. They think it is but a few minutes' work that the dentist should always *throw in.* And the reason for this opinion is that dentists are in a large majority of cases in the habit of giving but a few minutes to this kind of work, and consequently the operation is not half performed, simply torn in pieces and left in a ragged condition, a disgrace to the operator, and instead of benefiting only aggravating the case.

We know that a set of teeth so poorly cared for that the mouth has become filthy, is unsightly, uncleanly, and offensive, in fact, an abomination to one laying any claim to cleanliness, yet we, as dentists, are asked and expected to look for an hour or two into this cess-pool of filth and to keep our eyes open and our stomachs right side up, while we are performing this unpleasant and sometimes disgusting operation for little or next to nothing.

Who wonders that it is neglected, and yet when we see the benefits derived from it by our patients, we are led to ask, Why it is ever neglected?

Simply because we have not done our whole duty in this matter. We have not only failed to teach those coming into our hands the importance of it, but also have again and again failed to perform the operation in a thorough and faithful manner.

It appears to me to be a piece of sheer stupidity to put fillings into a dirty and diseased mouth, without a preparation looking to a better state of things.

A lady came to me not long ago to see what could be done for an abscessed central incisor, said it had been under treatment for eight months, but without success. An examination showed her mouth to be in about the following condition: the incisors, cuspids and first bicuspids below were covered with salivary calculus, nothing to be seen but their cutting edges; both sides of the second bicuspids and molars above were in about the same condition; rings of salivary calculus around the necks of all the other teeth, with pus flowing out from the gums and around each tooth, and pressure upon the soft parts caused pus to ooze from every pore. And that tooth was under treatment eight months by 'a man calling himself a dentist, without a suggestion to the patient as to the true condition of her mouth. There is nothing a dentist can do that will redound more to his credit, or the pleasure and profit of his patient, than to remove salivary calculus and all deposits from the teeth. Thoroughness is all-important in this, because particles wherever left are so many nuclei for new deposits.

There is another matter in which many of us are to some extent at fault. It is in not laying more stress upon the necessity for the early training of children in this matter of cleanliness and care of the teeth. For instance, take each man's practice (the adult portion), and I venture to say not one patient in fifty knows how to brush his teeth properly, nor one in a hundred that the sixth year molars are not members of the deciduous set, or if they be cleanly or otherwise. If this be true, to whom are we to look for early training? Evidently not to them.

Then let us look this matter squarely in the face. It must be met; it can neither be set aside, assigned, nor distributed. The responsibility rests upon us as a profession. Then let us see that we so teach our patients that they may become competent to train the young, and by so doing cause them to assume the responsibility, or at least share it with us. The greater part of this teaching must of necessity come from us.

And still another thing, though perhaps not properly belonging to this paper, I wish to speak of. I have had patients referred to me by physicians, and quite often of late, as suffering from scurvy, and have heard dentists talk of their patients having scurvy. In a practice of twenty-five years I have never seen a single case. Scurvy is a disease which is characterized by a depraved condition of the blood. In consequence of this morbid state of the blood there is a great debility of the system at large, with a tendency to congestion, hemorrhage, etc., in various parts of the body, and especially in the gums. It is said to have prevailed in badly-fed armies and in besieged cities, which I do not believe.

Its ravages among seamen, however, have been most appalling. There are instances where whole crews have been prostrated by this scourge, as in the case of Lord Anson's memorable voyage. Scurvy is a systemic disease, as much so as typhus or typhoid fever. Scurvy resembles purpura very closely in its general symptoms, and yet, notwithstanding their similarity, they are essentially different. Scurvy is caused by privation for a long time from fresh, succulent vegetables. In this disease there is extreme debility and depression of spirits, and mercury does positive harm, while a cure is rapidly effected by the use of fresh fruits and vegetables.

On the other hand, in purpura, mental and bodily depression are always absent, and mercury in most cases affords relief, while not a sign of relief follows the use of fruits and vegetables that are all powerful in scurvy. And here, in my judgment, is where confusion began, by calling purpura, scurvy (land scurvy), a term entirely out of place, I think. I do not believe such a disease as land scurvy ever did or ever will exist.

But why salivary calculus should ever, under any circumstances, be taken for scurvy, is a mystery to me, at least. There are perhaps two symptoms—congestion and hemorrhage of the gums—which are as much symptoms of typhoid fever as of scurvy, for they are symptoms of typhoid fever, and they are to be relied upon in both mild and severe cases. How can scurvy exist in a land like ours, with a soil from ten to thirty inches deep, growing all kinds of vegetables, especially potatoes, and a thousand miles from God's salt ocean? I would not advise a dentist practicing in this State, at least, to ever tell his patients that they have scurvy, but instead, tell them the truth, that their mouths are diseased and filthy, caused by salivary calculus, which in ninety-nine cases in a hundred, is the parent of Riggs' disease, or so-called, pyorrhœa alveolaris.

DISCUSSION.

Dr. Newkirk.—This question is of much importance. The paper is one of the most practical we have had on this subject for a long time. In regard to scurvy, the observations of a Swedish navigator have overthrown the theory that a cure can be produced only by a diet of vegetables and acid fruits; it was observed that they recovered by eating fresh meats. It is a fact that the removal of tartar is a very much neglected operation, a man is not justified in leaving a mouth otherwise than clean. He should always *clean* the teeth before beginning so fill; the presence of tartar will often prevent the proper adjustment of the rubber dam. Dr. Marriner has a set of cleaning instruments that are very appropriate and useful. I want to have them shown to the Society. He made them himself, and I can testify to their utility.

Dr. Taylor.—It is not so difficult to learn how to remove tartar, as how to prevent its deposit. Calculi are found in all parts of the body, especially where a foreign body is present for a nucleus. I doubt the truth of the statement that the trouble is more prevalent in limestone regions than others. Calculus is not only found in the mouth, but also in the bladder, testicles and tonsils. I would like to know how to prevent tartar.

Dr. Brophy.—Sometimes we get into queer situations. Last year Dr. Patrick gave a paper on food and diet especially adapted to provide the necessary calcium salts. Now Dr. Taylor wants to know how to prevent their accumulation abnormally. There are no remedies to be relied upon for prevention of this accumulation. It may be accomplished by withholding lime from the food, but if the supply be short the body will suffer. Some patients who suffer from deposits in bladder, etc., have been benefited by using distilled water. Prophylactic treatment would be very desirable if possible. Removal is constantly necessary both of tartar and stone in the bladder. I should like to see Dr. Marriner's instruments. If it is possible to get tartar off in bad cases where it is down in bifurcations and hollows of bicuspids, I should like to know how it is done.

Dr. McKellops.—As regards the preventing of the deposit of tartar, it is impossible. I found this same condition of the teeth to exist in the collection of skulls in the possession of my distinquished friend from Belleville. How are we to get proper pay for these operations unless the dentist places a sufficient value on his services. Put a *value* on your services, make a charge for everything you do, make the patient feel that your services cannot be had for a fee of fifty cents or one dollar. I would like to see instruments that would remove tartar successfully. Apropos to this subject, I received a valuable suggestion from my friend Dr. Coffin, of London. After removing all the tartar possible at the first sitting, he applies a solution of carbolic acid and glycerine with a thin blade, run around the tooth. We must teach our patients how to correctly brush their teeth.

Dr. Patrick.—Here are two teeth presented. I have never seen teeth in this condition but the cell-wall and root membrane were gone to the point where the tartar extended, and I know of no better remedy for the prevention of the accumulation of tartar than to keep the teeth clean; if, however, calculi have formed on the necks of the teeth, and encroached on the alveolar walls, the remedy is clearly surgical—simple removal—instructing patients afterward to at least keep their teeth in the future as clean as they do their faces. I have never seen tartar in the bifurcation of the roots of a tooth, but such a tooth could be removed with propriety. All that I have read or seen of the so-called "Riggs disease" and the remedies therefor, is not of a character to convince me that the disease has its origin in a certain perverted condition of the blood, whereby unorganized concretions are deposited directly from the fluid (the blood) without the mediation of an organ of secretion; nor have the advocates of the so-called "Riggs disease" furnished an analysis of the blood showing a departure from a healthy condition, and the remedies advocated are all of a topical nature, which, if successful, would be proof positive that the disease is local, and not of a constitutional character; for if a disease involves the entire system, as would be the case in a perverted condition of the blood, topical or local remedies would be as useless as to cut the toe-nails for a disease of the scalp.

Dr. Talbott.—I am more than pleased with the remarks of Dr. McKellops. The time has come when we must regard decay as almost a secondary consideration. Ninety per cent or so of people have Riggs disease. We are compelled to acknowledge this and take care of them. (Showed tooth with tartar extending two-thirds length of root on one side.) This patient was for eighteen years in care of a member of this Society who had filled the teeth well. The patient was sent to a physician and in consequence lost very many of her teeth. *We* must treat these cases, and patients must know we are *treating disease*, not cleaning teeth, merely.

Dr. Sitherwood.—I am much pleased with the Doctor's remarks. Dr. Swain sent me a lady patient from Chicago suffering with Riggs disease, which was successfully treated with a solution of glycerine, eucalyptus and wild indigo.

Dr. Brophy.—I have frequently seen cases where the teeth were coated and the alveoli nealy all destroyed, yet the dentist was endeavoring to save them. I think it useless to try to save teeth after their bony support has been destroyed.

Dr. Taylor.—(exhibiting a tooth)—I would like to know if this is sanguinary tartar. I have seen cases in ill health where there was no tartar, but when the system was in better condition then it would be deposited an abundance. There is ammonia present when there is tartar. Diet will in many cases improve the condition—this, then, is a remedy. The brush is also a remedy. I hope to see the time when we can prevent its accumulation.

Dr. McKellops.—No matter how healthy the mouth, tie a string around a tooth and tartar will form, consequently one must be very cleanly. Have never seen any good results from eucalyptus. The use of carbolic acid crystals dissolved in glycerine will cause the most speedy and gratifying results.

Dr. Crouse.—(exhibiting a specimen)—Asks *Dr. McKellops* if he ever saw a deposit of tartar on a tooth like it, and the tooth not loose?

Dr McKellops.—Yes; you will find this deposit at the end of the root when there is but a slight opening in the gum.

Dr Crouse.—I have seen this deposit at the end of tight roots, when there was no abscess or fistula to permit the deposit from the mouth, hence this must be sanguinary calculus. The operation of removing tartar high up is very difficult and troublesome. *Salivary* tartar is compartively easy. I suffered for many years from dyspepsia; it was necessary to remove tartar from my teeth every month or so, and the brush was used four or five times daily. When I recovered (under treatment of hydrochloric acid, lemon juice, etc.) the deposition of tartar nearly ceased.

Dr. McKellops.—Said Dr. Crouse must have found the deposit at the apex of the root, where there was abscess. Had not found it where there was no abscess.

Dr. Crouse.—I have a patient who pays me $75 per year for cleaning his teeth. It is a constant fight. I thought he had a dead pulp in one case where it was alive, and the trouble was tartar. I think I charged him $80 for cleaning that tooth. I worked four or five half days on that one tooth, which is solid and all right today. At one time I could have picked it out with my fingers, the alveolar plate was gone from the labial surface. I have seen cases where I could not prevent this deposit. One lady patient lost all her teeth in spite of all I could do.

Dr. Talbot.—I believe Riggs' disease is not caused entirely by calculus. It may be caused by any mechanical irritation. One can produce it by tying a string around a tooth. I believe that the inflammation produced by forcing the rubber dam under margin of gum,and tying ligatures on the teeth is a prolific cause of this disease. A man aged 35 years, had been under treatment for Riggs' disease ten years; came to me with several teeth ulcerated around necks; intensely painful. Applied aromatic sulphuric acid; found at last that it was a case of poisoning of periosteum by tobacco. No tartar.

Dr. Tibbet.—I am glad Dr. Talbot has mentioned this case. I have a family in my practice who are losing their teeth from disease of the periodontal membrane, without the formation of any deposit. This family do not use tobacco.

Dr. Taylor.—I believe this Society has recently lost a valuable member, due to a calcareous deposit in the arterial coats. Wherever there is inflammation there must be the products of inflammation. I believe the deposit on the tooth shown is as much a case of sanguinary calculus as that on a bullet.

Dr. Townsend.—As regards the irritation produced by the use of the dam mentioned by Dr. Talbot, I get an excellent effect by applying the fluid extract of calendula after removing it.

Dr. Stevens.—I think it must be the ligature and not the rubber which would cause this trouble. Possibly some keep the rubber on longer than I do. I think there is syphilis in many of these cases. Two patients in my practice suffering from Riggs' disease have admitted a taint of syphilis in their blood.

Dr. Patrick.—The question of transmission of syphilis from father to son is now considered by best authors a mooted one. It seems to be proved that while suffering from it there are no spermatozoa in man or power of procreation in woman; however, patients who have had it may be affected in a thousand ways.

Dr. Brophy.—I am surprised at the statement of Dr. Patrick. We know children who have never been exposed have all the symptoms of syphilis. The teeth, nails, and the whole system shows the presence of the disease.—*Trans. Illinois State Dental Society*, 1883.

Dr. Oulmont and M. Gubler state that aconitia is a perfectly successful remedy in simple congestive facial neuralgia in two or three days, and that it has also a good effect in secondary neuralgia, dependent upon such cause as dental caries, otitis paraphlegia, etc. In neuralgia of the fifth pair of nerves its effects are particularly striking. The intermittent type requires the addition of quinine. —*The Druggist*

DENTAL SOCIETIES.

MISSISSIPPI VALLEY DENTAL ASSOCIATION·

FORTIETH ANNUAL MEETING, HELD AT CINCINNATI, MARCH 5, AND 6, 1884.

Phonographically reported for the ARCHIVES OF DENTISTRY, BY F. W. SAGE, D. D. S.

WEDNESDAY MORNING MARCH 5.

After organizing, a paper, illustrated by blackboard drawings, was read by Dr. G. W. Smith; Subject, "Treating Nerve Canals of Dead Teeth." This was supplemented by remarks by the author on mounting porcelain crowns, in which he dwelt on the beauty and utility of gold bands and backings as a support for the crown, and urged the importance of devoting ample time to each case, in order to secure a perfect result. Dr. W. S. How followed with an illustrated description of his method of mounting crowns. Dr. H. A. Smith remarked, later, that in certain cases where the roots were broken or decayed considerably below the gum line and presented a bell shaped opening, he had found difficulty in securing a proper alignment of the platinum screw-post with the porcelain crown. In these cases he departed from the detailéd instructions of Dr. How, and overcame the difficulty by attaching the post with cement to the crown, and then forcing both to their final position at once, then removing the cement and proceeding as per instructions. He liked this method of Dr. How, because he had found by experience that it enabled the operator to proceed by clearly-defined steps to a final result, satisfactory to himself and his patient. It is of vital importance, he has found, that the concavity on the end of the prepared root be made rather deep, so as to prevent any rotation of the artificial crown. The time required for the operation, after having the root prepared, is from one to two hours.

Dr. F. A. Hunter.—For many years I have made a general practice of mounting teeth on roots, employing various methods from time to time. I consider Dr. How's method the most feasible, and the best that has been hitherto brought to my notice. I have mounted perhaps ten or a dozen of his crowns within a year, and I consider the system very complete, because you have things under such perfect control. In the case of bicuspids, a porcelain face can be put on stronger and better than by any other method, to my knowledge and in my judgment. It has proven very satisfactory in my hands. Dr. Smith has directed attention to the great importance of hollowing out the root for the reception of the porcelain crown, to a sufficient depth to insure the latter's not turning on its axis. [This refers to the concavity conforming to the festoon of the gum.—Rep.] That is of indispensable importance to the stability of the crown, and should not be overlooked.

Dr. J. Taft.—I have never tried Dr. How's method of mounting crowns. It is similar to many other methods in that if all the steps are well taken, good results may be obtained. It has perhaps more advantages than some others. One of these is the facility of adapting the crown and then securing alignments. Many operators are in too great haste to accomplish the best results. Take such a case as the one in the diagram before you. [A lateral root, decayed a line or more below the border of the gum.—Rep.] We find, in attempting such an operation, that there are difficulties we do not suspect. Dr. How has, no doubt, a great many little turns and resources which would not at once occur to a novice. Although the operation might be performed under his very eyes, by Dr. How, many little details would probably escape his notice. He would need to improvise and work out other details, in addition to all he had learned from close observation, before he would be possessed of that peculiar facility which would enable him to proceed uninterruptedly to the achievement of a successful result. In regard to instances of very badly decayed roots, perhaps much is attempted which would better not be attempted at all. Where there is a marked predisposition to inflammation, I should hesitate to make any more than a merely experimental operation. Take a person whose health is good, who is well nourished, and you can do almost anything in the way of operations which in the case of another would be wholly unadvisable. You could almost put a pivot into the socket of an extracted tooth in one case; in another, you might well hesitate to even probe the pulp canal. We should select our cases in accordance with the indications of diathesis. Where there is manifestly diseased condition of the gum, in many cases, the contact of a filling material above the gum line, as in the case in the diagram, would not be tolerated. At all events, where amalgam or any other plastic is used about the ends of the roots above the gingival border, great care should be taken to finish it smoothly and flush with the margin of the root. It is important to have the gum in a healthy condition; where there is tumefaction or hypertrophy, the operation should not be attempted at all.

Dr, H. A. Smith.—I approve all that Dr. Taft has said. In what I said about the difficulty of attaching the crown to those badly-decayed roots, I had particularly in view the mechanical aspect of the case, and expressed no opinion as to the advisability of attempting the operation, regarding the case from a pathological standpoint.

Dr. How.—Of course there are limits to all apparent possibilities. In actual practice, no doubt, efforts are often misdirected to the salvation of roots which ought to be extracted.

Dr. G. W. Smith.—Dr. How's method of mounting crowns is certainly deserving of high praise, even granting that it does not render all the hitherto impossible cases possible.

Dr. Sillito.—I have set a number of crowns by Dr. How's method, and am pleased with the results I have been enabled to attain. In one instance, where I failed in my endeavors to mount a crown by other well-known means, by resorting to this method I succeeded in fixing on a crown which has now done good service eight months.

Dr. Jennings (*sotto voice*).— It will be delivered next month. (Laughter.)

Dr. J. Taft.—Dr. How recommends pressing back the gum with cotton and sandarac varnish, as is often done in other operations, in order to fairly expose the end of the root. I presume that he continues the process of expansion until he has secured sufficient space to admit of finishing the plastic filling above the gum line. Now that needs to be done carefully, so as not to excite inflammation. By prolonged pressure you are liable to induce a condition not easy to control. It is commonly expected that only those who have full knowledge of all these things should do the talking. I should like to hear from some who do *not* know.

Dr. C. M. Wright, Chairman.—Shall the Chair call out some who do not know?

Dr. Taft.—Yes, if you please.

Dr. Wright.—Dr. Cassidy, will you please expose your ignorance? (Laughter.)

Dr. Cassidy.—I know *too* much. (Renewed Laughter.)

Dr. Taft.—Dr. Corydon Palmer carved out and attached a crown of walrus tooth to supply the loss of a molar crown in his own mouth. It was attached with screws so skillfuly as almost to defy detection. That was many years ago.

Dr. Berry.—I have always been afraid of trouble when setting crowns on diseased roots, and yet I have frequently done it. I always tell the patient beforehand that he may have trouble. When I undertake such operations I want some assurance of my patient's confidence in my integrity, so that in case of failure I will not be unreasonably blamed.

Calls for Dr. Jennings, who failed to respond.

Dr. Frank Hunter.—I consider it a marked breach of etiquette, not to say a outrage,that a man should come down here from Northern Ohio and sit in this assembly, absorb all that is said, and never open his mouth. Can't somebody make him get up. (Laughter.)

Dr. Jennings.—I am paying my way and I want my money's worth, first. (Laughter.)

Dr. Sage.—I have not yet tried Dr. How's crowns, although I have several times thought I would do so. Have had a difficulty (of which I have heard others complain) in using amalgam about the Bonwill pins in roots, in that the mercury amalgamates with the pin, and the latter soon breaks. The method described in Richardson's Mechanical Dentistry, credited to Dr. Edwin T. Darby, is, though nothing new, an excellent one (when properly performed) for all front teeth. It consists of a strong platinum wire, fitted into the root, over this thin cap of platinum, covering the end of the root accurately, a plain plate tooth backed with platinum, and finally soldered to the pin and platinum cap with pure foil scraps. The appliance admits of proper alignment,is more cleanly than a wooden-pivoted crown, and much more accurate in adaptation and much stronger. A large wire should be used, or there will be danger of its bending. A smaller wire of stiffened gold may be used, but more care will be required in soldering. The various steps of the operation are easily understood and mastered, and with ordinary care no uncertainty attends the final result. When you have finished the appliance and place it in the mouth, you find that it fits exactly. It may be reset, usually in a few moments. The peculiar advantage of this method is that if there be any failure it is usually simply a failure of attachment of the pin in the root, which is easily remedied. The appliance is usually found unimpaired, and all that is required is ten or fifteen minutes for resetting. I use a rather large platinum post (made to order) in the root, and it never bends. At present, the advantage of having a wide range for selection from either plain, plate or rubber teeth, gives this method the preference over some others. The method is not quite perfection, but what other method of mounting crowns is free from all objection ?

Dr. Van Antwerp.—Spoke of the importance of a deep concavity in preparing a root for How's crown.

The subject under consideration being passed, the Chairman, Dr. Wright, read a paper, entitled "Phosphate of Lime and the Teeth."

Dr. A. O. Rawls.—The administration of complementary food is not generally well understood.The elements contained in natural food are supplied directly to the organs and tissues, in a degree more or less discernible. It is not sufficient that the food appropriate for the nourishment of tissues be merely supplied ; to accomplish the desired object assimilation of such food is requisite. We know that complementary food administered to a pregnant woman will, under favorable circumstances, benefit her and the child as weil, but how many women will you find who are willing to submit to the conditions favorable for the accomplishment of the results desired ? Exercise is the great requisite,and indeed it would seem to be all-sufficient to insure health in the child; certainly without it the mere administration of complementary food will hardly avail to improve matters. Tonics administered to increase the neural circulation, or the blood circulation, will accomplish nothing without exercise. Among the children of the better classes, those who are kept in-doors and at school, you will not find so much evidence of a deficiency of lime-salts in the blood, but the frail character of their teeth must be attributed to their lack of free out-of-door exercise ; in short to defective nutrition. They perhaps subsist on delicate viands, pulpy food, and their teeth suffer for lack of the exercise which nature designed them to have. Use one side of the mouth exclusively in masticating, and in time the opposite teeth will suffer from the neglect of exercise. The complementary foods in the shape of medicines have their place, but I apprehend that they are not infrequently prescribed for patients, when a prescription calling for plenty of light, air and exercise would be more suitable.

Dr. H. A. Smith.—There are many crude experiments made in the use of phosphates. Man is peculiarly constituted, physically, in that he is omniverous. Certain races subsist on meat entirely, others on fish, others again on vegetables and fruits. Which of all these classes have the best teeth? Is it the Icelander or the Greenlander, whose diet is almost exclusively meat; or is it the maccaroni-eating Italian, or the rice-eating Chinaman, or the English or American, whose diet is various? I was interested, some time since, in certain observations and comparisons made by an eminent English agriculturist and scientist. He states that the English wheat-grain, which is larger and plumper than the American wheat-kernel, contains a larger per cent of albuminoids. The tabular statement is to the effect that the English grain contains 13 per cent of albuminoid, or starchy substance, the American grain, 11.95 per cent, and the wheat of the Pacific Coast, 8 or 10 per cent only. Now it is the starchy food which he claims is the most valuable. We, on this side of the water have generally held the belief that the outer shell which contains the gluten or albumen is the most nutritious part of the grain. Dr. Smith showed the hexagonal structure of the internal part of the grain, also the arrangement of the several layers composing the shell, by illustrations. There are six layers. These contain the phosphates. Taking into consideration the contrasts which are discovered by an examination of the nature of foods upon which the races appear to thrive the world over, the question, what food is best adapted to promote the development and strength of osseous structures, would seem to be involved in much that is obscure and perplexing. He surmises that in the instance of a pregnant woman, the nutritive process by which the fœtal structure is developed is analogous to the development of the chick in the shell. The inner layers of the shell are appropriated by the developing embryo, so that the shell, becoming more and more thinned, admits finally of the release of the inmate at the proper time. So in all probability the child draws on the mother for bone-making material. Dr. Smith cited the case of his children. Three, who always ate bread made from bolted flour, have good teeth, while the teeth of the fourth, who early exhibited a decided preference for brown bread, are the poorest of all. It is worthy of note that while the urine of the adult often contains phosphates, that of the child contains none.

Dr. G. W. Smith.—What do you think of milk?

D. H. A. Smith.—Give the child all the milk it wants. Milk contains a larger amount of the phosphates than meat or the cereals.

Dr. G. W. Smith.—Knew a child seven years old who had "never eaten anything but milk," and whose teeth were excellent.

Dr. Van Antwerp.—Dr. Johnson, the author of the dictionary, remarked that in England oats were used to feed horses, and in Scotland to feed men. Some one replied that that accounts for the excellence of the horses in England and of the men in Scotland. The Scotch, in the Highlands, have good teeth. In Glasgow they have bad teeth—no better than the Londoners. Air and exercise no doubt have much to do with this.

Dr. H. A. Smith—An observer states that he saw many bandy-legged children in the region of Glasgow. A similar fact was noticed about Iceland. The lime-salts in the water used are probably scanty.

Dr. C. M. Wright, Chairman.—Dr. Cushing, of Chicago, made the remark that he believes from his clinical observations that the exhibition of lime-salts would sometimes assist a woman in pregnancy when the natural food would not assimilate.

Dr. Sage.—It has been shown that at the very time the fœtus was supposed to be appropriating more than its share of the lime-salts from the mother, a free elimination of the salts from the system was going on. In this condition of the mothers' system would the exhibition of artificially prepared lime-salts be indicated? Much diversity of opinion as to the efficacy of this artificial means for repairing the waste, prevails among scientists in the medical faculty.

Dr. Osmond.—It was formerly, and is still, the practice with many, to administer the hypophosphites in uninterrupted doses to pregnant women. That is a mistake. I administer the medicine for two weeks, and then allow a lapse of two weeks, At the end of the fortnight some nausea may be noticed. I have again and again seen the hypophosphites administered to pregnant women whose teeth were poor, with the result of securing for the child a good set of teeth in after years. As to the effects of lime-water, at a certain watering place I visited in England, in 1880, the teeth of those living in the vicinity were very poor. The bicarbonate of lime in the springs readily induced petrifaction upon articles placed in them, and yet the teeth of the dwellers there soften rapidly. What are we to infer from that?

The principal constituent of our teeth is the phosphate of lime. Generally speaking, it is certain that in some regions where the water is very hard, teeth are very bad. In other regions, where the hardness of the water is not produced by bicarbonate of lime, there is plaster-of-paris formation, which is less noxious. The sulphate of lime has a different effect upon the teeth from that produced by the carbonate of lime.

THURSDAY MORNING SESSION.

The subject announced for discussion was: "What means are best adapted for maintaining the teeth and mouth in a healthy condition?"

Dr. Taft—Opened the discussion of the subject by calling attention to the duty of the dentist to instruct the patient about the care of his teeth. The dentist should not shrink from the performance of disagreeable work. In all professions there is the scavenger's work to be done.

Dr. Osmond—Has discovered that many who use the brush, use it in the morning only. He always begins his course of treatment by attention to the removal of tartar, etc., and often waits a day or two before further operations. Recommends the use of tooth-powder at night particularly. Water alone may be used in the morning.

Dr. H. A. Smith—Recommends the use of Listerine as a mouthwash. He spoke of the early discovery of bacteria in the mouth. On September 14th, 1683, Antony Van Lieuwenhoek, of the Netherlands, gave notice to the Royal Society of Great Britain that he had seen with the microscope little animals moving in a lively manner in the white substance scraped from his teeth—the first bacteria ever seen with the human eye. He described several varieties, easily recognized as *Bacilla*, *Bacterium*, *Leptothrix Buccalis*, etc. He wonders, since he cleans his teeth, how so many creatures manage to live in his mouth! He found after drinking hot coffee that they had disappeared. After awhile they reappeared. In 1692 he made accurate drawings of these various animalculæ (fungi), which to this day have not been surpassed. He (the speaker) doubts whether the presence of these parasites in the mouth is of important significance.

Dr. Berry—A celebrated microscopist told me he had discovered bacteria in his own saliva. His mouth was in a very unhealthy condition. Conjoined suppuration of the alveolus and the gums, as the old writers called it, was noticeable. He lost several of his teeth finally.

Dr. G. W. Smith—Bacteria are not peculiar to a diseased condition of the mouth; they are found in perfectly healthy mouths. Whenever accumulations are found about the teeth bacteria may be discovered in abundance. They are not always destructive. But if the mouth is neglected, they may be very destructive.

Dr. Jay.—I have more than once sent patients home to brush their teeth and clean their mouths before I would operate for them. Too often the dentist's reputation is made to suffer when the real blame lies with the negligent patient. Too many of our patients fail to attend to our injunctions.

Dr. Osmond.—By way of a gentle hint I have sometimes suggested to a patient the advisability of getting weighed before having tartar removed. After having had the tartar removed and the gums treated, I recommend the use of a rather soft brush. To avoid injury to the tender gums I advise a brush with the outer rows of bristles cut away. An unbleached Russia bristle brush is best. It will outlast half-a-dozen bleached bristle brushes. The bristles of these brushes are wired in, and are consequently more durable. I obtained a lot of these unbleached bristle brushes from a London firm, but there is now an American firm manufacturing the same brush.

Dr. Taft.—Of all the antiseptic mouth-washes there is perhaps nothing better than Listerine. I have used it for about a year.

Dr. Jay.—How do you use it?

Dr. Taft.—Like other washes, upon the brush. It is especially useful as a wash, to be used before retiring. Those who sleep with the mouth closed have, perhaps, less need of a brush than many others. At all events their teeth will decay less rapidly. At night the watery portions of the saliva are thrown out, and the mucus becomes agglutinated, and injury to the teeth results. The presence of bacteria in the oral cavity is, perhaps, of little importance; still, as an essential of cleanliness their removal is desirable, and this may be accomplished by using Listerine. I do not, however, regard them as a prime factor in decay.

Dr. Osmond.—I do not regard bacteria as worthy of any very particular consideration. Parasites abound in all parts of the system.

Large fleas have little fleas,
And those have fleas to bite 'em,
And there are fleas to feed on these,
And so, *ad infinitum.*

TO BE CONTINUED.

MISSOURI DENTAL COLLEGE.

The Eighteenth Annual Commencement of the Missouri Dental College was held on Wednesday, March 5th, 1884, at 7:30 o'clock P. M., in Memorial Hall. The valedictory address was delivered by Prof. G. Baumgarten, M. D.

Prof. H. H. Mudd, Dean of the College, conferred the degree of Doctor of Dental Surgery on the following gentlemen: Bliss Malcolm A., Ill.; Blake Alfred E., Cal.; Campbell William O., Mo.; Henderson George S., Mo.; Winston Warwick, Mo.; Wickersham William R., Mo.

Warwick Winston, D. D. S., received the S. S. White Prize, a set of Varney pluggers and case, for best examination in all branches. This is the first time the prize has been given to the college to be awarded by the faculty, to the most deserving graduate. H.

SELECTIONS.

NECROSIS OF THE UPPER AND LOWER LEFT MAXILLA. LOSS OF THE UPPER JAW.

BY DR. LEON DUFOUR.

During the course of an epidemic of measles which prevailed at Fecamp in the spring of 1883, many cases showed signs of great malignancy; others presented anomalous complications.

Among the latter we may include four cases of necrosis of portions of the upper or lower maxilla.

Three of these cases recovered under different modes of treatment, and were only followed by the elimination of small portions of the external tables of the affected bones; in the fourth case, the child lost a large part of the upper left maxilla, and also a small piece of the lower jaw. The following account refers to the last case:

B., a young child aged three and a half years, brother and father both of lymphatic temperament; very lymphatic itself also; never had any illness except slight infantile affections; dentition perfectly normal.

This child caught measles, which ran a very rapid and regular course. Eight or ten days after the child had recovered, the mother brought it to me and showed me its gums, which were now affected, complaining at the same time of the fetid smell of the child's breath.

The little girl was pale, had lost her appetite, was in great pain, slept badly, was very feverish.

The breath had a most repulsive smell.

The left side of the face was swollen; the skin normal, neither shining nor spotted. The underlying tissues were quite free, not œdematous, and retained their functions, notwithstanding the swelling at the back.

On separating the cheek from the lip, the gums were seen to be much redder than usual. They were very puffy, especially above and to the left. On the right side the edge of the gum was in a healthy condition, though somewhat inflamed; but on the left it was ulcerated for several millimeters above the edge of the alveolus, and allowed the left upper maxilla, deprived of its periosteum, to be seen. On percussion with a metallic instrument, the bone gave quite a characteristic sound. The ulcerated border of the gum was of a greyish tint, and had slightly affected the mucous membrane of the cheek on a patch two or three centimetres long and a few millimetres wide. The teeth were quite loose in the alveoli; one appeared ready to fall out and was therefore removed. Below and to the left there were the same appearances, but not so well marked.

The respiratory, cardiac and digestive functions were all normal, with the exception of some fever and the loss of appetite.

The child was put on a strengthening régime, and stimulating lotions of hydrochloric acid were ordered to be used at short and frequent intervals.

After three or four days of this treatment, the odor of the breath was less overpowering, but the ulceration of the edge of the gum had increased, and a larger portion of the upper left maxilla was now exposed.

The child was still feverish, did not take its food well, and was in constant pain; before long the breath became as offensive as before, both to the parents and to the little sufferer herself. The spontaneous elimination of the bone appeared inevitable. Lotions containing tincture of cinchona were ordered instead of those with hydrochloric acid, together with a tonic and antiscrofulous diet.

Three weeks after the first appearance of this complication the upper left maxilla was so loose that it was removed with the greatest ease by means of an elevator. The quantity of blood lost was no greater than after the extraction of a tooth.

From this day forward the child's spirits returned, the breath lost its fetid smell, and the appetite and general state became as good as before.

On the other hand, however, the ulceration of the lower jaw, though but slight, and on a level only with the alveolo-dental border, went on increasing; it ended two or three weeks afterwards by the exfoliation of a small osseous lamella of the anterior and posterior external plates of the bone around the first molar (deciduous).

The necrosed portion which was removed consists of the left upper maxilla from the alveolar border to the bottom of the sockets. Its extent corresponds to five teeth, the two incisors, the canine and the two molars.

The ascending process of the jaw has disappeared, but the lower portion of the nasal duct is still to be seen. Part of the tuberosity of the jaw has been removed. The only portion of the palatine process which remains is that in contact with the alveolar border.

The cavity in the mouth caused by the loss of the bone is now bounded in front by the healthy cheek, behind by half the arch of the palate.

On the other side the condition of things is perfectly normal.

The result is a flattening of the left cheek with a deep external furrow, which causes the left angle of the mouth to be drawn upwards, and produces a great deformity, more especially when the child laughs.—*Gazette de Hopitaux*, *in Brit. Jour. Dental Science.*

Thunder storms cause milk and fermented liquors to sour by the deposition of dust, and therefore of bacteria with it, due to the disturbed electrical condition of the atmosphere.—*Aitken, Royal Society of Edinburgh.*

THE ADAPTATION OF THE TEETH TO THE ALVEOLAR PROCESS.

BY STORER BENNETT, F. R. C. S., AND L. D. S. ENG., L. R. C. P. LOND, ETC.

Read at the Annual General Meeting of the British Dental Association at Plymouth, August 24th, 1883.

Mr. President and Gentlemen.—The subject to which I invite your attention, though of a less practical character than others which have previously been brought under your notice, may yet, I trust, prove of sufficient interest to warrant me in trespassing on your forbearance for a few moments in order to review the various means adopted by nature for the attachment of teeth.

There are, as is well known, four different methods by which this end is attained, viz:—an attachment by ligament, by anchylosis, by means of a hinge, or by the implantation of the tooth in a socket.

The simplest form of attachment, that by ligament, is found to prevail among the cartilaginous fishes, where there is a continuous succession of teeth being developed, which are attached by the base to a process of dense mucous membrane that gradually travels over the jaw from the lower surface to the upper free margin. Each tooth is in use for a limited time, after which it is shed, bearing with it the portion of mucous membrane by which it was attached. But one, or at most, two, teeth in a series will be found in position at a time, the successional teeth in various stages of development lying protected under a covering of the mucous membrane of the mouth, so placed as to free them from injury either to themselves or their possessors.

Anchylosis we find is the method of attachment which obtains in a large number of teleostean fishes.

The base of the tooth in its early stage of development is attached to the jaw by mucous membrane which subsequently becomes infiltrated with lime salts and converted into spongy cancellous bone. As osteo-dentine frequently forms a large proportion of the structure of fish's teeth, it is often extremely difficult in examining specimens to say exactly where the tooth substance really ends and the jaw bone begins, the transition from tooth to jaw being so gradual that no clear line of demarcation can be defined.

The solidity of the attachment varies greatly in different fishes. In some, where there is a frequent succession of teeth, the structures are broken away from the jaw with comparative ease; in others again, the connection is so firm that only the greatest violence is capable of severing the union, and even then it is frequently found that a portion of the jaw itself has been torn away with the tooth.

Of *hinged* teeth we were until lately supposed to possess in the lophius a solitary example among fishes, but about six years ago, while making some investigations which were afterwards communicated to the Royal Society, Mr. Charles Tomes discovered that well marked hinged teeth were possessed by the common pike, and the hake was also found to possess hinged teeth of a very perfect character, while on further investigation other members of the gadoid tribe were noticed to possess them in a more or less modified degree, a gradual series being traced through various members of the tribe till the perfect hinge culminated in the hake.

In fishes with hinged teeth the free margin of the jaw is prolonged upwards in specialized columns corresponding to the tooth to be supported. The tooth itself rests by means of a widened base on the summit of this process of bone, but unattached to it save by means of an elastic ligament connected to its posterior surface, the lateral and anterior surfaces meanwhile being free. By this means pressure exerted on the front of the tooth causes it to assume a horizontal direction, immediately to resume its former vertical position on the pressure being removed.

In the cod a similar development of the tooth and bone obtains, but an additional ligament connecting the anterior surface of the tooth and jaw greatly lessens the amount of movement permitted to the former.

In the poison fang of viperine snakes we have another example of a hinged tooth. But here, instead of the motion taking place between the tooth and jaw, the tooth is anchylosed to the maxillary bone, and the movement takes place at the lachyrmo-maxillary joint, by the maxilla being rotated through a quarter of a circle on the lachrymal bone, and carrying with it the poison fang.

We are at present unacquainted with the existence of hinged teeth in any other creatures than fishes and viperine snakes; but, in consequence of some investigations on which I am now engaged, I have reason to believe that this method of attachment has a far wider existence than is generally supposed.

The remaining method of attachment, viz., by the implantation of a tooth in a specialized socket of bone, is that with which we are so familiar among mammals. A special development of loose spongy bone is built up from the jaw and grows around that portion of the tooth to be imbedded, a layer of periosteum intervening between the tooth and bone for their mutual nourishment; and herein we have a distinction from all other methods of attachment, socketed teeth being the only kind in which periosteum is found between them and the jaw, and this condition remains constant throughout the life of the tooth, for in no case does the membrane disappear and the tooth become anchylosed to the bone, as is so commonly the case in unsocketed teeth.

The following microscopic and other preparations were shown to illustrate the paper:

(i.) Jaw of shark showing teeth *in situ*.
(ii.) Jaw and tooth of common pike.
(iii.) Jaw and teeth of lophius piscatorious.
(iv.) Jaw and tooth of hake fish.
(v.) Jaw and tooth of cod fish.
(vi.) Jaws of viperine snake.
(vii.) Jaw and teeth of mole.
(viii.) Jaw and teeth of hedgehog.
(ix.) Rostrum and teeth of saw fish.
(x.) Jaw and incisor of rat. —*Jour. Brit. Dental Assn.*

ALVEOLAR ABSCESS TREATED BY AMPUTATION OF THE ROOTS.

By C. W. Dunn. L. D. S., Florence.

I see by the last number of the "Cosmos," which has just come to hand, that Dr. Farrar speaks of the amputation of the roots of a tooth affected by abscess?

Dr. Farrar, although he occupies two pages of the "Cosmos," has got only so far in his explanation as to promise to tell how to do it, at a future time. Will you allow me, in a few lines to say how I have practiced the amputation of roots in similar diseases.

I take a tube about two or three lines in diameter, the extremity of which is a saw, and, applying it to the engine, I cut through the gum, alveolar process, and apex of the root, and generally am successful in bringing it away with its sac inside the tubular saw. If it does not come out in this way, it will, after a few days, show itself at the surface of the wound, and can then be readily removed and without pain.

I have at the present moment a case where there had been a fistulous discharge under the chin for some years. I amputated the apex of the root of the right central inferior incisor about a month ago. I see the patient occasionally, and the discharge at the chin has completely ceased, and every symptom seems to promise a favorable and permanent result. The tooth also is quite firm and the gum seems well healed. I shall, however, wait another month before I fill the nerve canal so that all parts may be in as favorable condition as possible.

I do not wish, by these remarks, to claim any priority, but I think that it is a very old and well known operation. It seemed to me unnecessary to take so much time and so much space to describe what is a very simple and easy operation. But perhaps we shall learn, when the next number arrives, that Dr. Farrar's manner is simpler still, and therefore better.—*British Journal Dental Scinnce.*

DR. CUSHING ON TEMPERING INSTRUMENTS.

As it would be impossible for me to give a demonstration of the method of tempering instruments which more than a very few could witness, I will endeavor briefly to state the method as shown me by Dr. Corydon Palmer,whose success in this line is well known to some of the profession. The instrument being forged and filed to nearly the dimensions of the point to be made, should finally be forged into shape and slightly hammered until cold. It should then be heated to the dullest red heat and plunged into cold water. If this hardens it so that the file will not touch it, it is right ; if not, it must be heated again, but to a slightly brighter red, and then plunged. This must be repeated until the point is of the requisite hardness.

What we wish to accomplish is the making of the point of the proper hardness at the very lowest degree of heat at which it can be done, and that can only be known by experimentation with each lot of steel.

When the point is sufficiently hard the instrument should be brightened with emery paper and the point of the instrument passed endwise into a piece of soft wood, say an eighth of an inch square by one quarter inch long,as far as it is desired to retained the hardness, and then the temper is to be drawn from the shaft toward the point with the pointed flame, until the whole is of blue color up to the wood, when the instrument is to be again plunged into cold water. It should now be ground into final shape.

Instruments thus tempered will surpass any that it has been my fortune to obtain from any manufacturer.

Dr. W. N. Morrison described his method of tempering. "I first forge the instrument as near as possible to the shape desired, leaving as little surplus as may be necessary for grinding. Do the forging at a low red heat on a warm anvil. The steel is hardened in the flame of a blow-pipe and plunged into water cold enough to cast the scale.

Throw the flame on the heavier part of the instrument. Never allow the point to go beyond a dull red. I use lead instead of wood to protect the point in drawing temper, passing lead and instrument together through the flame, and promptly submerging both in water as the right color is reached."—*Trans. Ill. State Dental Society*, *1883.*

STAINING ARTIFICIAL TEETH TO MATCH EXCEPTIONAL NATURAL ONES.

BY MR. WILLIAM DUNN, JR., OF FLORENCE.

As in the *British Journal of Dental Science*, for December last, it is stated that it would be a great desideratum to be able to so stain or colour artificial teeth as to make them exactly represent any exceptional natural ones that they may be required to match, it may interest your readers to know that the means are at command which will enable them to exercise their utmost ingenuity and artistic taste to this end, and to accomplish their wishes with really very little trouble to themselves and to the greatest appreciation of their patients. The process which I have adopted for some time in actual practice is as follows:

Thanks to the exertions of Mr. Lacroix, a chemist, in Paris, we have every requisite colour ready to our hands prepared for porcelain painting and put up in colour tubes similiar to all moist artists' colours, which can be obtained of Lechertier Barbe & Co,, 60 Regeet's Street, London. The colours which I generally use are: yellow, green, dark blue, brown, pink and black; all these colours are readily dissolved by essence of turpentine or essence of mint, when with a fine camel hair pencil they may be blended in any combinations, and the surfaces, necks, tips or other parts painted, tinted, lined or otherwise made to perfectly coincide with any natural teeth however irregular or particoloured they may be. Of course in most instances it is necessary to grind or disfigure the artificial teeth before painting them, and thus may be represented the worn down teeth of advanced age which so frequently show the dark brown tinted dentine within a circle of paler enamel, or the dark ring enamel with the light center; the stained crowns of the bicuspids and molars under similiar circumstances, the dark necks of denuded teeth, although the enamel surface may remain a good colour, the blue-black appearance of carious teeth, either stained naturally or from amalgam stoppings. If naturally, it is very effective to grind notches out of the artificial teeth to represent decay and stain within and around the parts so disfigured. Honeycombed teeth may also be well represented by similiar treatment. Indeed, there is practically *no limit* to the capabilities of the materials in skilful and artistic hands.

I find a *white* pallet advisable for mixing the colours.

After the teeth are painted they should be placed on pieces of platina or platina gauze, or in separate crucibles, for care should be taken that they do not touch one another.

If a whole set has to be coloured it will be found convenient to fix them in a row in a mixture of two parts of plaster of Paris and one part of fireclay—which will not crack in firing. In this way a more uniform tint can be given than if done separately.

For firing I prefer the handy and simple but effective little gas furnace invented by Mr. Verrier, in which it takes about five minutes. The sufficiency of heat can easily be determined by watching until the crucible becomes a cherry red. Care must be taken not to overheat, otherwise the colours—especially the lighter ones, will disappear. These colours are as a general rule unalterable, but the operator must bear in mind that in passing through the vulcanizing process they are apt to become a little darker, and regulate his tints accordingly. At the same time the darkness can be corrected, if necessary, by applying fine sandpaper or pumice powder.

With the pink colour a very fair imitation of the gums can be produced; quite efficient in most cases of a single tooth, to prevent that disagreeable and unsightly appearance so often seen, of a long tusk, rather than tooth, between two short teeth.

With a little attention and practice anyone may soon master the initial difficulties of this painting work, and few, once having seen the advantage of the results, will again be content with the old method of using the nearest colour attainable.—*Brit. Jour. of Dental Sciences.*

ALVEOLAR ABSCESS SIMULATING CATARRH.

A case of this character, which came under Dr. Marshall's observation, was that of a gentleman, aged 30 years, who had been under treatment for catarrh for a year and a half. Coming to have his teeth cared for, the central incisor, on the right hand side, was found to be devitalized and tender; it always gave trouble whenever a cold was taken. It was also noticeable that the catarrhal discharge was always from the right side. He opened into the tooth and found, after cleansing it, that water could be forced through it into the nostril. The tooth was treated, and, with its cure, the catarrhal trouble disappeared. Another young man, a student of dentistry, had an incisor which had been devitalized by his preceptor. It was neglected and an abscess formed. He also had a discharge from the nose. On examination, the condition of the incisor was discovered, and, on its being treated, the nasal discharge disappeared.—*Ibid.*

ANTIDOTE TO ARSENIC.—Dr. James B. McCaw suggests the following formula as one not generally known as an antidote to arsenic, and claims for it precedence over all others; first, because it forms the surest antidote; and second, because the ingredients are always readily accessible. Tincture of chloride of iron, one drachm; bicarbonate of soda (or potash), one drachm; tepid water, a teacupful. Mix. The sesquioxide of iron is immediately formed in a solution of chloride of sodium. Give this mixture almost *ad libitum.* It is a perfect antidote to arsenic.

JOURNALISTIC.

"Reading maketh a full man; conference, a ready man;
and writing, an exact man."

CAULK'S DENTAL ANNUAL for 1883-4, contains a great amount of useful and interesting matter for dentists. We give a few of them:

The American Dental Society was the first dental association that ever existed.

Amalgam, it is said, was first used in 1835, being simply filings of silver coin and mercury.

There are now over forty different methods in vogue for mounting artificial crowns upon natural roots.

The rubber patents for dental plates cost the profession, for license and other expenses, over $10,000,000 while in force.

A well-informed author estimates the number of teeth which are annually extracted in the United States at 20,000,000, and the number of artificial teeth used in the same period at 8,000,000.

In 1820, the number of dentists in the United States did not exceed 100. Dr. Chapin A. Harris, in 1830, estimated the number at above 300. They increased to 1,400 in 1842, and in 1858 to 4,000. Now, the number is variously estimated from 12,000 to 15,000.

The career of 1,000 dentists has been traced to the following results: 163 died before they reached middle life; 643 attained fair success; 57 made a competence; 27 died from intemperance and other vices; 96 failed entirely, and three committed suicide.

Nineteen States have laws regulating the practice of dentistry.

There are twenty Dental Colleges, in the United States, including dental departments in universities.

The Dental periodicals of the United States number twenty, of which twelve are monthlies, seven quarterlies and one annual.

In addition to these statistics a number of original articles are given.

THE INDEPENDENT PRACTITIONER, February, gives as the first article, an interesting paper by Dr. W. D. Miller, of Berlin, Germany, entitled, "Fermentation in the Human Mouth; Its Relation to the Caries of the Teeth." He says, "The first stage of dental caries consists in a decalcification of the tissue of the teeth by acids, which are for the greater part generated in the mouth by fermentation.

The object of his experiments was to determine this ferment and the conditions essential to its action.

His experiments go to show that it is an organized ferment (fungi), which is capable of producing an acid, when sugar is present.

He is not quite sure, but thinks that the organism "is simply the fungus of lactic acid." Further experiments will be made to determine this point.

"In the light of these experiments the thorough decalcification of the tooth substance in caries is easily accounted for. The saliva is, no doubt, always, particularly in the mouths of unclean persons, impregnated with sugar, either taken directly into the mouth, or formed there by the action of the ptyaline of the saliva upon starch. * * * Wherever this stagnates between the teeth, in fissures, etc., especially during sleep, it *must* become acid. When a portion of the dentine has become decalcified, it, as is well known, takes up the liquids of the mouth like a sponge, and the fungi with them, and the fungi, being independent of the free access of air, go on producing acid within the dental tubules. As each layer of dentine becomes softened in turn, the micro-organisms follow after, continually producing acid. Hereby the existence of the zone of softened non-infected dentine is readily understood.

"The production of acid is entirely independent of the reaction of the saliva as it enters the mouth, hence the uselessness of "'testing the saliva' for acid. That the liquid squeezed out of the tubules of *decaying* dentine has an acid reaction, every dentist in America who has a piece of blue litmus paper, and is not color blind, can easily prove for himself."

Dr. W. St. Geo. Elliott, London, discusses "System as Applied to Instruments and Books." He has socket handles and all have celluloid centers, in different colors and various shapes so that the proper instrument may be easily detected, when lying upon the table, or are in regular order in the drawers.

No doubt but this is a good system and saves time.

He also urges the importance of keeping records. He says: "Although so much satisfaction is derived from system, yet, go where you will, it is the absence of it that you notice. Who ever saw a watchmaker or jeweler keep his tools in order, and yet while admitting that time is money, and that system saves time, they always act as if it might be good for others, but not for them. Finally, let me implore you to cultivate that of which nature has given us so many examples, system.

We all wish to excel in our chosen calling; then let us take the means at our disposal for our assistance, systematize our instruments, our books, our ideas, our operations."—And we would add our time.

BRITISH JOURNAL OF DENTAL SCIENCE, January 15.—Dr. L. P. Haskell's paper, "The Past, Present and Future of Mechanical Dentistry" is the first paper.

He considers that the past thirty years have seen but little, if any, advancement in this branch of dentistry, and blames rubber for it.

He says: "To-day the merest tyro can buy a set of 'gum sections,' a piece of rubber, take an impression, and make a so-called set of teeth, but it is sickening to witness the result, as one moves along the street, enters the public assembly, or the social circle. 'Artificial Teeth' written everywhere. This is the present."

In order to make the future better than the present he advises us to create a public sentiment that shall demand something better than rubber or celluloid as the best or as even a good material for plates. He further says, that more attention should be paid to artistic or æsthetic dentistry. He would not entirely dispense with vegetable bases, as many are not able to afford anything more expensive, and advises the use of plain teeth, as with them better results may be obtained.

We scarcely ever use anything but plain teeth. The country practitioner has to fight gum teeth, for that is the fashion the Cheap Johns have set.

THE NEW ENGLAND JOURNAL contains a number of original articles, the first one being, "Early Treatment of the Teeth," by Dr. G. F. Eames, Boston, Mass.

In order to educate the people, he advises the giving of public lectures, and, to avoid the appearance of advertising, let a practitioner lecture to the community in a section where he does not practice and have a brother talk to his patients, making exchanges between different towns and cities, giving sound information to the people. He advocates treatment of the teeth "as soon as tooth material begins to be deposited in the development of the fœtus in utero."

Dr. D. M. Clapp, another Bostonian, gives an interesting review, going over the different modes of filling with gold that have been in vogue during the past twenty years.

The editor of the *New England Journal* was the first to announce that the MISSOURI DENTAL JOURNAL was not dead but sleeping. Perhaps hibernating would be a good term to apply in this case.

THE DENTAL RECORD, London, February. "Prehistoric Teeth," a letter to the editor of the *Independent Practitioner*, by Dr. W. D. Miller. He says: "Wherever man is found, there caries of the teeth and its concomitant evils will be found also. I do not say, nor do you say, that prehistoric races were, or that modern uncivilized races are,as much tormented with this disease as modern civilized races. I should be inclined to think not; but that caries was present in its worst form ; of that there can be no doubt." * * * "In looking over the tabulated results obtained from the examination of nine hundred specimens, I am able to draw no other conclusion than this: Whatever deleterious effects the vices of civilization may have had upon the structure of the teeth, however their power to resist the agents of decay may thereby have been reduced, the origin of the disease *caries dentium* itself must be sought for at a time and place were neither modern nor civilized influences had existence."

The editor devotes eleven pages to "Journalistic Summary." This is following the example of the MISSOURI DENTAL JOURNAL, which was the originator of "Journalistics."

We find the following in the department devoted to "Gossip." "While a servant girl, in Thurso, was cleaning a codfish, in December last, she found a complete set of false teeth." We do not know how they got there; probably the fish swallowed the wearer of the teeth, but was unable to digest the teeth. It does not seem probable that a fish would be so foolish as to try to make a meal of a set of teeth. Is this a "cod?"

THE DENTAL REGISTER as a leading article gives "A Biography of Dr. James Taylor," who was born in 1809, and died June 12, 1881. He was one of four brothers all of whom were dentists.

They laid a broad foundation for the rising profession of dentistry. He was one of the founders of the Ohio College of Dental Surgery, the second of the kind in the United States: he was a professor in the college for about twenty years and voluntarily retired with the honors of emeritus professor and continued to deliver lectures every session.

Dr. Taylor with his brothers, Drs. Edward and Joseph, were of those who organized and sustained the Mississippi Valley Dental Association. His counsel was always sought in every important movement, and his suggestions and advice always carried great weight. He was the first editor of the Register and continued to edit it for nine years. His lectures were usually prepared with great care, being mainly written out in full. In October, 1878, he again took up active work in the college, having been appointed Professor of Operative Dentistry. He continued to occupy that position till his death. His great interest in young men preparing for the work of the profession was shown, not only in his college work, but in his ever-ready disposition to advise with, and counsel students, and young practitioners.

He continued in practice up to within a day or two of his death, the immediate cause of which, was paralysis of the heart, induced, probably, by prostration from overwork.

A new department appears in the *Register* called "Salmigundi" edited by Dr. E. G. Betty. In this department will appear "the countless odds and ends" that otherwise might go to waste.

THE SOUTHERN DENTAL JOURNAL, for February, gives an excellent picture of Dr. H. J. McKellops, of St. Louis, President of the Southern Dental Association.

The editor says, "We are delighted to publish Dr. Spalding's letter, showing the old and valuable MISSOURI DENTAL JOURNAL to be not dead, but ready to come forth with renewed vigor. We shall hail with delight its re-appearance. Let every dentist subscribe for it.

Same to the *Southern Dental Journal,* brother Catching.

THE BRITISH JOURNAL OF DENTAL SCIENCE, for February 1, gives an editorial on "Dental Literature Abroad, and Our Journal."

The editors say: "Of no profession can it be said more truly than of ours, that we live in an age of progress." * * * "In the department of literature perhaps, the greatest changes have occurred, the most marked progress has been achieved. In America, every month seems to give birth to some fresh departure in journalism, or some new serial appears, while the volumes which cause the booksellers' counters to groan, attest to the constant unflagging energies of our transatlantic brethren. Nor is America singular in this; France and Germany each send their quota of dental journals, and Italy, although she boasts of fewer, yet supplies periodicals of unquestionable merit.

To be a dentist is not simply to *have been taught* in a short school curriculum; but now-a-days, *the* dentist begins his education when he commences practice, and only he can hope for first-class work and a reputation, who can show that he has kept himself abreast of the times and is aware of what is going on in the world around him."

He alludes to the keen contest going on among dentists, to maintain the high position they have always held on the continent and in America.

"Dental Education in France" furnishes another editorial.

A new dental college has been founded there. French writers admit that the standard has not been up to that fixed for the profession in England, but the *Institut Odontotechnique de France* intends to furnish means to remedy the defect.

America lends her aid to the new undertaking in the person of Dr. Bogue, of New York.

T. B. Welch, M, D., editor of *Items of Interest*, always gives good editorials.

"The Therapeutic Value of Rest and Sleep" is the first theme discussed. "Many a disease is cured by it more speedily and thoroughly than by the power of drugs, and many even on the brink of insanity are saved by the comatose effect of an overtaxed brain." * * * "Try it sometime. When so 'utterly done for' that you think your whole body is going to rack and ruin, instead of sending for the doctor, go to bed, dismiss business and trouble, and turn your face to the wall."

"Teach the People" is another editorial. He says: "The prevention of disease, the instruction of the people in what is right, showing them how to avoid disease, this is the work of the professional. It is this which must raise us above the sphere of mere mechanics, to the dignity of a profession. What we want is that broad, liberal culture which fits us to be teachers of the people, and then that philanthropy which is characteristic of the highest wisdom."

Dr. G. S. Palmer splits a raisin, sprinkles the inner part with capsicum, and finds it a good substitute for a pepper bag.

ERUPTION OF A RIGHT UPPER CANINE INTO THE RIGHT NOSTRIL. —*The British Journal of Dental Science*, of February 15, 1884, gives in the proceedings of the Odontological Society of Great Britain the following:

"Mr. Moreton Small then showed models of a case in which the right upper canine had erupted into the right nostril. The patient, a girl, aged seventeen, applied to Dr. de Haviland Hall, at the Westminster Hospital, suffering from ozena and general debility, the result of inherited syphilis. There was nothing specially interesting in the history of the case. She was admitted into the hospital, where her health greatly improved, and after keeping her under observation for a short time the tooth was removed by Dr. Walker.

The temporary canines were present in the mouth. The case had been brought by Dr. Hall before the Medical Society of London, where it appeared to excite great interest.

Dr. Walker remarked that it was difficult to imagine without having seen the patient, how great a disfigurement was caused by this protruding tooth in the nostril. It was well implanted, appearing quite firm to the touch, though easily extracted with the forceps.

In reply to Mr. Hutchinson, Mr. Small said the tooth appeared to have given rise to no irritation whatever; there was no sign of periostitis or of abscess."

HARPER.

WAX PAPER.—Dipping the paper into melted wax or paraffin produces a water-proof paper ; but the latter has the disadvantage of being too brittle and allowing the wax or paraffin to peal off. A much better result is obtained by mixing the wax with certain soft resinous bodies. The following formula yields a nice product: Dissolve ½ part of bleached white caoutchouc in 1 part of liquified white Venice turpentine, add 10 parts of wax, and melt the whole together on the water bath. This mass is applied with a broad brush on paper, from which it will not separate. On cooling, the coat of wax may be polished by rubbing with a smooth rag.

MISCELLANY.

WATER AS A PROPHYLACTIC AND A REMEDY.

The subject of water drinking seems worthy of more than a passing notice. Many people have a notion that it is injurious to drink at meals. Of course one may swill down such an immense quantity of water that it shall be injurious, but a moderate quantity of fluid taken at meals is rather beneficial; the abstinence advocated by many is injurious.

A large class of patients are affected with symptoms of an undefined character, a vague unrest and disquiet showing itself by discomfort or even pain, sometimes in one place, sometimes in another; they are usually also subject to constipation; often have an unhealthy hue of the skin; they are frequently classed as hypochondrical or hysterical; there is no well defined disease. It has long been my custom to inquire of patients thus affected as to the amount of drink they take and how much urine they pass. Often the amount of drink is much below the average; there is a tendency to dryness of the skin; the urine is scanty, high colored and strongly acid, sometimes depositing a sediment on standing. Under the use of an increased amount of water the perspiration is increased, the urine becomes more natural and the unpleasant symptoms diminish or disappear.

The waste of tissue-changes in the system must pass into the blood and can leave the system only in solution. During comparatively good health the amount of blood is maintained at nearly the same figure, only so much water will be parted with through the skin, lungs and kidneys as can be restored from other sources. If too little water be ingested the perspiration will be slight, the elimination of urine will be diminished, and the excretion of waste material will be lessened. The blood will be continuously saturated with the results of disassimilation or nearly so, the removal of the waste of tissue-changes is not accomplished with sufficient regularity, and the tissues become clogged with used-up material, and nutrition is interferred with. The balance each day against, was very slight, but finally there is such an accumulation that unpleasant symptoms are developed. If the person continues to eat heartily, either the surplus food passes off by the intestines, or is deposited in the shape of fat, the nitrogenized portions assisting to load the urine with urea and urates. Let a person drink a larger amount, and, the blood having a sufficient supply of water, more urine is excreted ; the loss is made good to the blood by absorption, and a larger amount of waste products is taken up to be eliminated ; more urea, phosphoric and sulphuric acids pass off by the urine, which is increased in amount ; there is more disintegration of the tissues. This loss is made up by new material, so nutrition is increased.

Water taken with the food favors digestion ; when taken into the stomach a part is absorbed by the gastric vessels, carrying with it the soluble constituents of the food. So much as is not immediately absorbed assists in softening and breaking up the larger particles of food, and thus aids in the gastric digestion by facilitating the action of the gastric fluids. A portion of the water is carried off into the intestines with the semi-digested food and acts favorably in the same way ; also, the blood being well supplied with water, the fæces are not so hard and dry as would otherwise be the case, and it is easier to keep the bowels regular.

It is certainly no matter of surprise that there should be malaise and distress, when the system is loaded with worn out material, unfit for the functions of life, which the blood cannot remove for lack of menstruum ; it is not surprising that the nervous system, which most requires regular nutrition, should suffer most ; that muscles badly nourished should ache on motion ; that kidneys called upon to secrete an abnormally concentrated urine should become diseased ; that the highly acid urine should irritate the bladder.

This view may explain why herb teas, thoroughwort, chamomile, sage, etc., were so popular in our grandmothers days, indeed are now popular. The bitter herb is a slight gastric tonic, but the water is a better solvent. Formerly the good housewife supplied the deficiency in drink by regular doses of herb tea ; now the physician supplies it by draughts of mineral water.

How much water should an adult drink in twenty-four hours? It must be taken into account that water is excreted by the lungs and skin as well as by the kidneys ; also much of the food ingested contains water as one of its constituent parts. Hence the amount of liquid required as drink must vary slightly with the activity of the skin and the character of the food. If much of the diet is made up of soft solids, fruit and watery vegetables, less drink will be needed than if the diet is composed of dry meats and vegetables. The amount of soup ingested would also affect the amount of mere drink required. The average amount of urine passed in twenty-four hours by a healthy adult is stated by Dr. Flint to be about fifty-two ounces, the extremes being thirty-five and eighty-one ounces. The amount of drink necessary is stated by Dalton to be about fifty-two ounces, that is, 3.38 pints. An ordinary coffee-cup holds six or seven ounces. The equivalent of eight or nine coffee cups of drink would not then be an excessive amount. Repeatedly patients have told me that they drink only one or one and a half cups, morning and evening, and about the same at dinner, only occasionally taking soup, averaging less than six cups, sometimes small tea cups, of drink. Sometimes patients say they drink generally only a little more than a pint a day.

After one has for months and years averaged an insufficient amount of drink, and the system has become charged with used-up material, it may not be wise to immediately administer large draughts, whether of ordinary drink or of mineral water, but the quantity can be rapidly increased, and soon the normal average may be exceeded for a while with advantage.

I remember one patient, a lady who came to me suffering from very distressing nervous symptoms not well defined, chiefly referable to the head ; more a sense of unrest and disquiet in the body than distinct pain. Five months previously she had gained an idea that she must not drink much, and so restricted herself to a cup of tea night and morning, taking less than a pint of fluid in the twenty-four hours. Five weeks before applying to me the above symptoms appeared, that is, about four months only after restricting the amount of drink. This may be called an acute case.

The following case, treated at the City Hospital, Boston, is an interesting example of the conditions found in these patients :

A man, 62 years old, entered the Hospital August 30th. He said he had had rheumatism at times since he was a boy, rheumatic fever seven years ago. For more than ten years he had noticed a red, sandy sediment in the vessel after micturition, which was frequent, and the quantity of urine was scanty. Seven or eight months before entrance he first noticed shortness of breath, which troubled him in going up stairs. There was a pain in the lower part of his back ; his hips ached so he could hardly step ; he had had numbness in the left leg for nearly a year. He had had jaundice two or three times and vision had been indistinct. He was a large fleshy man with a very large, tympanitic abdomen. He had a notion that he had kidney disease, dropsy and heart disease. There was nothing of the kind ; there was no cardiac lesion, no hepatic enlargement, no signs of Bright's disease. He walked as well with his eyes shut as with them open ; his gait was unsteady. He had had fainting fits, pain all over, heat in head and aching in back. No attempt was made to record all his complaints. On September 3d, 4th, 5th and 6th, he passed 20, 28, 29 and 18 ounces of urine respectively. He was told to drink more freely and received fl. ext. buchu. The amount of urine rose to 40, 50, 60 and 68 ounces ; his discomfort decreased and he soon expressed himself as much relieved ; he walked much better. As there was a possibility of a syphilitic taint he was put on iodide of potassium, but not until after the improvement had commenced. During the last twenty days of his stay at the Hospital he passed an average 47.5 ounces of urine daily.

A physician applied to me for advice in regard to himself. He had many symptoms referable to overwork ; I found he drank very little and was troubled with constipation. In this case the diminished supply of fluid was not only the cause of his symptoms ; but among other means to give relief, he was advised to drink more. In about eight months I saw him again. He was well qualified to observe the effects of remedies, and stated that the increase in amount of fluid ingested had been beneficial ; he felt better and was less constipated.

Human nature is such that if the doctor tells patients to drink two or three pints of Cochitnate or Croton water a day, in addition to his tea or coffee, they will rebel and think it a queer prescription ; but if he is told to take that amount of Poland or Allendale or some similar water, he forthwith has his keg of mineral water on tap, and drinks in faith that it will, in some mysterous way, relieve his gout, rheumatism, dyspepsia or kidney disease, or will be good for his headaches and tired brain.

Fothergill in his handbook of treatment touches upon the use of water in the way above indicated. (see pp. 52, 542, 506.) It seems to me that the insufficient ingestion of water is often a predisposing or even exciting cause of many diseases ; that this is more frequently the case than is usually supposed.

I find that a very large porportion of those who suffer from nervous exhaustion, neurasthenia as it is called, do not drink enough. Is it an American peculiarity to ingest so little fluid? I believe it is. Will this then partly explain the prevalence of neurasthenia in America?

I believe that one reason of success of the treatment adopted by Dr. Mitchell and advocated in "Fat and Blood," is to be found in the large amount of milk which he gives his patients.

It is not to be expected, however, that in all these cases the simple increase of fluid ingested will cure our patients. Too frequently the tissues have been so long illy nourished that that simple plan is not sufficient. The time to work the greatest cure with water is before the disease has begun.—S. G. WEBER, M. D., in *Archieves of Medicine*

DENTAL FORMATION IN THE NASAL CAVITY.

Prof. E. Fletcher Ingals, of Chicago, sends us the following regarding misplaced teeth:

Recently, in examining a patient who had for some time been troubled with nasal catarrh, I found on the floor of the left naris four centimeters back from the nostril, a hard substance, feeling, when touched with the probe, like bone. On seizing this with forceps the patient experienced severe pain, like that caused by striking a sensitive tooth, and for several hours afterward he suffered from pain like a severe toothache.

The pain caused by touching this body was so exquisite that it was necessary to produce complete anæsthesia before a thorough examination could be made.

Dr. R. H. Lull administered ether for me, and I then engaged the foreign body in the snare, which I use for nasal tumors, and drew it out, when it was found to be a supernumerary tooth, resembling closely the canine, and measuring two centimeters in length.

About five millimeters of the tip of the root had been exposed in the nasal cavity, and below this the tooth was covered with soft tissue, which adhered to it down to the crown. The dentine of the crown was perfect, excepting a small perforation at its apex, but within the tooth was decayed.

How long this tooth had been projecting into the nasal cavity could not be determined, but it must have been a considerable time, for the portion of the apex of the root which was uncovered had lost by erosion about a millimeter in thickness from its entire circumference.

It is comparatively rare for teeth to grow in the roof of the mouth or nasal cavities, yet several such cases have been met with. In nearly all instances the "wild tooth," as it is called by the laity, is found to be a supernumerary tooth or a misplaced canine.

Prof. E. S. Talbott, who examined the tooth and the patient's mouth, states that, from the appearance of tartar and green stain upon the apex of the crown, it must have occupied a diagonal position in the hard palate, the crown being in the roof of the mouth, pointing toward the central incisors, and the apex of the root in the naris, pointing posteriorly. A ring of tartar encircled the crown from about three millimeters below the upper surface to nine millimeters above the lower surface, and that part of the crown below the ring was covered with a fungus growth, which proved that this part only was exposed in the mouth.

The tooth had decayed because of the imperfectly formed apex of the crown, until the pulp had become exposed and death resulted, causing alveolar abscess, the sack of which came away with the tooth. While it is not uncommon to find supernumerary teeth in the roof and anterior part of the mouth, it is very rare to find the apex penetrating the naris.—*Jour. of Am. Med. Ass'n.*

ARSENICAL WALL-PAPER POISONING.

At a late meeting of the Medical Society, an interesting discussion was raised upon the ill effects of arsenical wall-papers, after a paper contributed by Mr. Jabez Hogg. Amongst the speakers was Mr. Carr, C. E., who said that bright colors can be produced without the aid of arsenic, although it is employed in many manufactures in which its use is not suspected. He considered that dangerous articles of this description should not be sold without a license or notice of their employment. He cited the occupation of green-japanning of tea-canisters as highly dangerous, many of those employed in the trade being soon obliged to give it up. The color used in green Venetian blinds is arsenical, and when the paint becomes decayed the particles of color fly off each time the blinds are moved. He also referred to the dangerous ingredients used in somo other indoor paints. He urged legislative interference in the trades in which these dangerous colors are used, and felt confident that the Government would interpose in this matter if applied to in a proper manner. Amongst other speakers both Mr. Malcom Morris and Dr. Brookfield, related how they had personally suffered severely from arsenical poisoning due to house-painting, and eventually, on the suggestion of the first-named gentleman, it was resolved to form a committee for the purpose of organizing a deputation to the Government.—*London Lancet.*

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PAMPHLETS.

A CONSIDERATION OF TEMPERAMENT IN RELATION TO THE TEETH. By James W. White, M. D., D.D. S. The S. S. White Dental Mnf'g. Co. Philadelphia, 1884.

HISTORY OF TREPHINING; FRACTURE OF THE INNER TABLE OF THE CRANIUM; DEPRESSED BONE; COMPRESSION OF THE BRAIN, ETC. By Wm. D. Foster, M. D. Kansas City, Mo., 1884.

ANNOUNCEMENNT of the College of Dentistry of the University of California, for its Third Session, commencing February 4th, 1884.

A POSTAL TELEGRAPH ESSENTIAL TO THE FREEDOM OF THE AMERICAN PRESS AND THE PROSPERITY OF THE AMERICAN PEOPLE. Speech by Hon. John A. Anderson, of Kansas, in the House of Representatives, Saturday, March 1, 1884.

SOCIETY NOTICES.

ILLINOIS STATE DENTAL SOCIETY.

The Twentieth Annual Meeting of this Society will be held in the Senate Chamber, Springfield, commencing Tuesday, May 13tth, 1884, and continuing four days.

OFFICERS.—President, Edmund Noyes, Chicago; Vice-President, H. H. Townsend, Pontiac; Secretary, J. W. Wassall, Chicago, (103 State street); Assistant Secretary, W. H. Taggart, Freeport; Treasurer, J. Campbell, Bloomington; Librarian, W. B. Woodward, Peoria. Executive Committee—Mark H. Patten, Chairman, Springfield; C. R. Taylor, Streator; C. R. Dwight, Danville

Board of Examiners—T. L. Gilmer, Quincy; K. B. Davis, Springfield; E. D. Swain, Chicago. Publication Committee—J. W. Wassall, Chicago; E. D. Swain, Chicago; Edmund Noyes, Chicago. Committee on Infraction of the Code of Ethics—R. Neal Lawrence, Lincoln; J. W. Cormany, Mt. Carroll; C. P. Pruyne, Chicago.

ANOTHER NATIONAL DENTAL SOCIETY.

To the President and Members of the State Dental Associations.—GENTLEMEN: The foremost men of our profession admit the fact that the name of American Dentistry has not that world-wide recognition which its honor demands and its history would warrant. In our opinion, this is an oportune time for a general movement to place it upon a basis commensurate with its dignity, and we venture to submit the outline of a plan for the purpose, which we think feasible, and which we hope will meet with your sanction and furtherance,

As a nation claiming to lead the world in the science and art of dentistry, we should have one great repesentative body by the profession to speak forth with authority its aims, duties and attainments.

Let us, therefore, organize a National Dental Association of the United States, composed of delegates elected by the various State organizations, an equal number from each State, to meet annually, and always at Washington, D. C. Thus, we would give to Delaware the same voice as to New York. In order always to secure a full meeting, we would suggest six as the number of delegates from each State; a like number of alternates having been elected. Let the National Association elect a Board of Regents, one from each State, who shall control its meeting, setting the time, etc.

As important adjuncts to this Association, we believe it would be found expedient to establish an extensive library, to contain dental works and publications, standard and periodical, foreign and native, and the founding of a national museum, to illustrate the past, present and future of dentistry.

The wonderful benefit to the profession and humanity in general to be derived from these is certainly manifest to every intelligent dentist.

We are sure that room can be obtained in the Smithsonian Institute for the museum, and in the library of the Surgeon General's office for the library. We are equally sure that Congress will grant an appropriation for both purposes, as is done for the medical profession.

Mature deliberation at the meeting for organizing will suggest the details of a scheme, which we have not thought it necessary to go into here.

In conclusion, we would respectfully urge that you elect, at your present meeting, delegates, with alternates, to meet for the purpose of organization, at the time agreed upen by the chairman of the different State delegations.

Do this in anticipation of like action upon the part of other State societies; then forward to Dr. B. H. Catching, Atlanta, Ga., the name and address of your chairman, and he will act as medium of communication between the different delegations, informing each of the action of the other, thereby bringing about unity of action.

Yours respectfully,
Frank Abbott, New York City.
J. E. Cravens, Indianapolis, Ind.
C. T. Stockwell, Springfield, Mass.
F. Searle, Springfield, Mass.
W. C. Wardlaw, Augusta Ga.
B. H. Catching, Atlanta, Ga.

The Association of American Medical Editors; Annual Meeting; Washington, D. C., May 5th, 1884.

The Annual Meeting of the Association of Medical Editors will be held in Washington, May the 5th, at 8 p. m-, in Medical Hall, southeast corner of Sixth and F streets.

The Annual Address will be delivered by President Leartus Connor, M. D., on "The American Medical Journal of the Future, as Indicated by the History of American Medical Journals in the Past."

Dr. N. S. Davis will open the discussion on — "How far can Legislation Aid in Elevating the Standard of Medical Education in this Country?"

All members of the profession, especially journalists and authors, are invited to be present and take part in the meeting.

John V. Shoemaker, M. D., Secretary.
Philadelphia, 1031 Walnut Street.

The Southern Dental Association meets at Lexington, Ky., on Tuesday, May 6th.

The Georgia State Dental Society meets at Atlanta, Ga., Tuesday, May 20th.

The Mad River Valley Dental Society meets at Dayton, Ohio, on Tuesday, May 20th.

The Nebraska State Dental Society meets at Hiawatha, Kansas, in connection with the Kansas State Society, on Tuesday, May 6th.

The Texas State Dental Association meets at San Antonio, Tex., on Tuesday, April 29th.

The Mississippi State Dental Associations meets at Jackson, Miss., June 3rd.

The Iowa State Dental Society meets at Council Bluffs, Iowa, on Wednesday, May 7th.

EDITORIAL.

DENTAL LEGISLATION.

France, it is said, was the first State to enact a law regulating the practice of Dentistry. While this law remained upon the statute-book, the profession of dentistry in France was held in high repute. The repeal of the law opened the practice to any one who chose to enter it, and the decline of dentistry in that country dates from that repeal.

Other countries, notably England, and nineteen (one-half) of the States of this country, have of late years enacted laws having the same object in view. England has labored long and heavily to secure legal protection, with a result that appears to be far from satisfactory to a majority of her dental practitioners. We have the authority of the leading dental journal of Great Britian for the statement, that, under the English act, "every surgeon is assumed to be a skilled dentist," and is empowered by law to call himself a dentist, and to engage in dental practice, while at the same time he is debarred from doing so, by being denied registration. In that, it is inconsistent in its provisions, that law is a little worse than that of New York, Massachusetts and some others of the United States, which entitle every M. D. to practice as a dentist, irrespective of any special knowledge he may possess fitting him for such service.

Such provisions of law as the latter, seem very absurd, and can with difficulty be accounted for, unless they arise from the idea that dentistry is a specialty of medicine, and as medical specialists are authorized to pursue their several specialties by virtue of the medical degree, the same rule should be applied in dentistry. That such reasoning is fallacious need not be said.

It was the impropriety of this somewhat prevalent M. D. provision, that led to the enactment of a law for the State of Missouri, which makes the holding of a dental diploma, granted by a reputable dental college or university, a condition precedent to the commencement of dental practice in that State. This is a very simple provision, but it proves to be a very effectual one. The principle has the sanction of experience, being similar to that regulating the practice of medicine.

Any one now preparing to engage in the practice of dentistry in the State of Missouri, is first required to register in the county where he proposes to reside. On appearing before the registering officer he is required to file a certified copy of his diploma and to state under oath that it is a genuine document and that he is the person to whom it was granted. If he cannot do all this, he is not allowed to register, and cannot commence practice without incurring the severe penalties which the law imposes. These penalties are intended to be, and are in effect, prohibitory.

We are pleased to notice that, by a recent amendment, the dental law of the State of New Jersey has been made similar to that of Missouri, We hope other States will profit by the example.

SIGMA.

With this number of the ARCHIVES we open a department under the head of Notes and Queries. It will be divided into two parts, first, Notes and Questions, and second, Comments and Answers. Under the head of Notes, brief remarks or criticisms on any subject connected with dentistry will be in order. Almost every dentist would sometimes like to ask a question. We wish every one to feel at liberty to do this, whether the question be simple, complex or abstruse. Whenever it happens that a question arises that the reader does not readily answer to his own satisfaction, let him just sit down and write it out, and mail it to the ARCHIVES, for a reply.

For comments on notes and for answers to queries, we shall depend largely upon our readers. This plan will yield a much greater variety of comments and much more numerous replies than would come from the editorial staff alone. All items in this department will be numbered, as also will be the responses. This method will, we believe, be found convenient. and will facilitate the connection of the items in the first division, with the related ones in the other.

NOTES AND QUERIES.

1. Will some one of the readers of ARCHIVES tell me if the operation of replanting teeth is likely to prove a permanent success? My experience has not pointed in that direction. At the same time will any one who has had the misfortune to lift a sound tooth partly out of the socket in extracting another one, tell me if it, as a rule, gets devitalized when pushed back into place? I have had two such accidents, and in both cases the tooth did not lose its vitality; and now, after some years, they both appear to be as good as any other teeth in the respective mouths. P. S.

2. Can any one say when "continuous gum" work was first set in vulcanite? I ask because I see it mentioned as something new, while I have a set in my possession which I made in 1860. It was a temporary case, afterwards replaced by a permanent one.
D. D. S.

3. What styptic is the most used for hemorrhage of the gums?
DENTIST.

4. I have removed a good many gutta-percha root-fillings, and have rarely found the canals free from odor. I should like to know if the readers of the ARCHIVES have had a similar experiene. The use of gutta-percha for this purpose is, I notice, being frequently recommended, but unless I have been unfortunate in the cases that have fallen into my hands, it may not prove to be as good as some of the older methods which it seems to be displacing. Should like to know what has been the experience of others, for or against. J. P.

5. Are the roots of deciduous teeth absorbed after devitalization and removal of the pulp? Will some one please answer, and if no, give the reason why they are not. S. M. C.

THE

Archives of Dentistry.

A Monthly Record of Dental Science and Art.

Vol. I., No. 4.] APRIL, 1884. [New Series.

ORIGINAL ARTICLES.

"Of all the arts in which the wise excel,
Nature's chief masterpiece is writing well."

NOTES—CRITICAL AND MISCELLANEOUS.

BY JOSEPH RICHARDSON, M. D., D. D. S.

A study of some of the characteristic features of contributions to the various dental journals of the country will, it is believed, be found not entirely without interest. We will attempt a partial classification of writers whose peculiarities are somewhat distinctive, and whose contributions establish largely the character and status of dental periodical literature.

When we consider that dentistry as a profession is something less than half a century old, its growth may be very justly considered phenomenal. This is particularly true of American dentistry. In speaking of its development in this country reference is had, not only to its advancement in art, but in science as well. For forty years and more these have gone hand in hand as co-ordinate elements of progress. While it is usual to accord to American dentistry precedence over other countries in its practical departments, it is equally customary to speak of its theoretical or scientific acquirements as inferior to those of some of the foreign countries.

Any supposed disparity in this latter respect is, we think, more apparent than real, and involves an evident fallacy. Art, as applied to dentistry, is but the application of the facts and truths of science to practical uses, and progress in the former therefore must represent equal progress in the latter,of which the first is but a sequence or outgrowth. Every improvement or discovery in art as applied to our specialty, presupposes a knowledge of some antecedent fact or principle in science on which such improvement or discovery is predicated. The art of medicine never yet took a position in advance of the science of medicine; the state of the former is but a reflex of the condition of the latter. Hence to concede that the art of dentistry in this country excels, is in effect to concede that the science of dentistry is in an equally advanced stage of development. Elsewhere, notably in England and Germany, the cultivation of the science of dentistry has been made conspicuous by reason of its comparative exclusiveness, the genius and learning of writers having been expended largely in the construction of theories, and in the discussion of scientific truths and principles without any corresponding application of them to the development of art. Outside of our own country, the growth of the profession has been in a measure one-sided, and therefore not so well balanced or symmetrical.

Nothing better indicates the truth of this statement than a careful study of the character of the contributions to our home journals. It will be apparent from such a survey that the dominating class of contributors to our dental periodical literature comprises writers who, by mental habit and temperament, are eminently practical and utilitarian, and who, broadly recognizing the fundamental maxim that the only legitimate and rational aim of all the sciences is the establishment and perfection of art, apply to everything they do or think the ultimate test of utility. *Cui bono?* is the practical query that confronts them at the very threshhold of every inquiry and every endeavor. With this peculiarly American bias the pursuit of scientific truth is entered upon, not so much from a love of abstract and recondite speculation, or a desire for the acquisition of curious and unproductive knowledge, as from an ulterior purpose of making knowledge tributary to the uses of art. With the class of writers under consideration, a knowledge of the sciences is but an instrument to work out useful results. They are concerned not so much about curious as about profitable truths. They are plain, thoughtful men, of good understanding, and of fair professional and scholarly attainments. Ideas emanating from such sources mean something more than fruitless theories and barren idealities. They signify something tangible and substantial—something that can be definitely estimated and measured—something that has in it abundance of wholesome and nutritive aliment—something that is upbuilding and helpful. Contributions of this class embody all that is most valuable in theory and practice, the outgrowth of personal experience, of conscientious study, experimentation, and observation, and represent the substantial basis and frame-work of American dentistry in its best estate.

In style, the contributions of this class are generally what might be expected of practical men of intelligence—terse and vigorous, often conspicuous for simplicity, purity, and elegance of diction, rarely declamatory, and never tumid or flatulent. Much of their literary work will rank favorably with the best productions of medical writers in subject-matter, in ability of treatment, in power and felicity of expression, and in the embellishments of rhetoric. The exponents of utilitarianism in the best sense of that word, they represent the highest development of the science and art of dentistry in the past, as they must continue to do in the future.

In contrast with the class of writers just mentioned are those contributors who, if not altogether dreamers, visionaries, and theorists, develop strong proclivities in the direction of abstruse speculations upon subjects or problems having little or no discoverable relation to the needs of the dental specialist — enigmatical questions which, even if solvable, are barren of all fruit that could directly or indirectly ameliorate the condition of mankind, equip them with new powers and instruments for usefulness, or enrich our own calling with new and helping discoveries. They are readily recognizable by an affectation of learning that in the main expends itself upon matters impractical, intangible, and occult. Affecting somewhat the role of practiced dialectitians, their wings are continually poised for ambitious flights into the limitless domains of speculative thought in the vain endeavor to penetrate the mists and fogs that enshroud, as with a pall, the unsolvable problems and mysteries that lie beyond the reach of human ken. Like the ephemeral light of a descending meteor, they may illuminate for an instant the professional horizon with a blaze of rhetoric, but the same silence and darkness that has ever defied and rendered abortive the search for unattainable truth settles again upon the mystic realms of the unknown and unknowable.

Another by no means inconsiderable class of writers are those who labor under the delusion that a communication to be striking and impressive must also be elaborate, and they proceed, therefore, however comparatively simple or unimportant the subject matter of the communication may be, or however susceptible of being succinctly stated, to spread out over a half-dozen or more pages of printed matter what might be as completely and intelligently presented in as many short paragraphs. And this prolixity in many cases is rendered intolerable, from the fact painfully apparent to the dullest apprehension, that the mass of non-essential and often irrelevant matter, which serves the purpose of a prolonged introduction to the main matter in hand, is little else than tiresome iterations of antiquated reflections and stale platitudes that are wholly without interest or instruction. Like a grain of wheat in a bushel of chaff, the amount of waste material is out of all proportion to the nutrient ingredient of the compound. The busy practitioner has scarcely time or patience to winnow such masses of verbiage for the small gain there is in it.

In refreshing contrast with the foregoing class are those epigrammatic writers who, having something to say worthy of being said and of being read, command the attention of all readers by penetrating at once to the very marrow and essence of their subject without unnecessary indirection or circumlocution, and whose general reflections or commentaries, when such are necessary or appropriate, have the grateful flavor of freshness and originality. One always feels like greeting such a writer with the cordial invitation: "Come again, and often."

Still another class, and the last to which we shall call attention, are the chronic controversialists—writers of irrepressible bellicose tendencies—who exhibit a marked predilection for the discussion of subjects about which there are irreconcilable differences of opinion, and which seem to have been originally introduced by professional malcontents for no other apparent purpose than that of stirring up endless, generally profitless, and oftentimes acrimonious disputation. Their very appearance in the columns of a journal is a menace, and their manner of treating their subject. at once irritating, dogmatic and intolerant,conveys as plainly as may be the persuasive invitation of the traditional Irishman who, spoiling for a row, accosted every one with: "Will some gintleman have the goodness to tramp upon the tail of me coat?" When one of this class succeeds in drawing the fire of an antagonist of like proclivities,the controversy as a rule degenerates sooner or later into a sort of professional sparring match, in which bad taste, bad temper and bad English struggle for the mastery in a way that disgusts every intelligent reader who is jealous of the good reputation of journalistic literature.

PERMANGANATE OF POTASSA AS A HÆMOSTATIC.

BY DR. U. L. BLU, INDIANAPOLIS, IND.

I have had a singular and satisfactory experience with this drug as a hæmostatic, in various kinds of hæmorrhage, a brief history of which may be of interest to some of my co-laborers. I have used it in dental practice for the last twelve years. In those cases where the teeth are covered with tartar, the gums swollen and turgid, bleeding freely on the slightest touch, I have had uniform success in checking the bleeding by rinsing the mouth at intervals, during the process of cleaning the teeth with a solution of this salt of the strength of about one grain to the ounce of water.

This experience led me to try it in an emergency, in another case. Being unexpectedly called, one evening, to a lady neighbor who was suffering from a bronchial hæmorrhage, and having nothing else in my pocket case on which I could rely, I resorted to permanganate of pot. which I gave in teaspoonful doses every ten minutes, of the strength of one grain to the ounce. I was both delighted and astonished at the result. By the time I had given the third dose, the flow had almost ceased. Thinking it was possibly a coincidence, I did not feel satisfied. Knowing the lady was subject to those attacks, I requested her to inform me of the next one, to which she readily agreed, and the opportunity offered in about four weeks for a further demonstration. The result was the same, from the same treatment. Since then, she has kept it in the house.

I have watched the case now for three years, and have never known it to fail.

CASE 2.—Mrs. R. negress, aged 52, nurse to a white woman, was attacked with a severe uterine hæmorrhage, caused by heavy lifting. On my arrival she presented a dirty, ashen color (normal color black). Pulse 56 and tremulous. Great prostration. I failed to take her temperature. Gave tablespoonful doses every five minutes—strength, two grains to the ounce. I cannot tell why I increased the dose in this case. Result: In thirty minutes the flooding was under control, and in less than an hour had ceased. She assisted in preparing breakfast next morning, and suffered no relapse up to the time of her death, which occurred in Chicago a year later.

CASE 3.—Mr. B. R. R. conductor, aged 48, sanguino-lymphatic temperament, had received a contused wound above the left eye during an altercation. Cut full length of brow. Bleeding profusely; could not see to place my stitches. Dissolved two or three grains in about four ounces of water, which I applied topically to the wound. In about ten minutes I put in three stitches without any difficulty.

His family physician then took charge of the case, and removed the stitches on the third day. The wound healed rapidly, and has left no scar.

CASE 4.—Post partum hæmorrhage. Mrs. M., prostitute, abortion. These facts I learned after my arrival, but I had no time to lose, if I wanted to save a life. Her condition demanded prompt action. She had fainted once or twice before my arrival. She was in a semi-comatose condition, temperature 95°, with no perceptible pulse at wrists or temple. Carotid responding feebly. Gave similar treatment, with the addition of a little tinct. capsicum and whiskey. Consciousness returned, flow subsided and a good recovery followed. This has been my own experience, faithfully given. I am profoundly ignorant of the "modus operandi" of its action, but do not think it is by the formation of fibrin, for, on the contrary, it seems to retard coagulation of blood. I have told many others of my wonderful experience, some of whom have tried it, and have had virtually the same results. Would be glad to have suggestions as to the theory of its action.

THE AMERICAN JOURNAL OF OPHTHALMOLOGY.—The first number of this new monthly special journal has come to hand. Its thirty-two pages are all filled with original matter, eight articles from seven different authors, two being contributed by the able editor, Dr. Adolf Alt. Under his direction the journal will command the favor of the profession as well in the East as in the West, and we predict a successful career for it.

DENTAL SOCIETIES.

MISSISSIPPI VALLEY DENTAL ASSOCIATION.

FORTIETH ANNUAL MEETING, HELD AT CINCINNATI MARCH 5th AND 6th, 1884.

Phonographically Reported for the Archives of Dentistry, by F. W. Sage, D. D. S.

[CONTINUED FROM PAGE 115.]

Upon motion the third and fourth subjects were considered conjointly for discussion. They read as follows : "What progress has been made in arresting and preventing decay of the teeth in the last five years? In what respect, if any, are decayed teeth better filled now than ten years ago."

Dr. H. A. Smith.— I infer from the wording of the third subject that the committee is of the opinion that we have made no progress during the past five years. I agree that we have made no progress so far as filling teeth with gold is concerned. Fillings were made fifteen or twenty years ago which are to-day absolutely perfect. And what is peculiar, they are apparently as solid as coin. There has been no advancement on that character of operations to this day. In regard to the manner of filling teeth with gold, I do not think there has been much advancement, but there has been a decided advancement made with respect to histological conditions; that is, with respect to protecting the sensitive dentine from the contact of the gold. I think we save many more teeth, by the judicious use of plastics as a foundation for gold, than formerly. I think a man who can make two operations in an hour,which another dentist requires two hours to make, serves his patient just as well and himself better. There is oftentimes too much excavating done. I have seen students in this college go directly for the pulp,because the tissue was quite soft in that direction. It is not necessary to remove the last vestige of softened dentine. I believe in making simple cavities out of compound ones. Where there is a large portion of gelatinous tissue, I would protect it with a thin film of paraffine. I use, first, an antiseptic application, drying the cavity with the warm-air syringe, wiping out with a little alcohol, drying again, and following this with a little paraffine, which melts at about one hundred and ten degrees Fahrenheit, and when cooled forms a persistent film. We can, by that method, obviate the necessity, oftentimes, of extensive excavating, Kill the germs of bacteria, and then fill up the tubules.

[Dr. Smith illustrated on the board the use of plastics preparatory to the insertion of the gold filling.]

Dr. G. W. Smith.—My treatment of large cavities is similar to that, except that I remove the superincumbent tissues over the pulps that have lost their lime-salts. Then I cap the pulp with oxide of zinc, borax, and creosote.

[To Dr. Hunter's inquiry as to what object he had in using the borax, Dr. Smith returned an answer in explanation, which was apparently vague.]

Dr. Taft.—One of the signs of progress at the present time is the general diffusion of information, and the general awakening of interest in the matters of hygiene, and the relation existing between the teeth and the health of the system at large, For the last fifty or sixty years these matters have received consideration from men here and there in the profession, but the rank and file have perhaps restricted themselves too much in their investigations to technical matters. I think, too, there has been some progress made in filling teeth of late years. Not only are more new appliances being introduced, but they are being more generally adopted. Formerly there was a more conservative spirit exhibited; only the bolder ones ventured to adopt new appliances or methods. The increasing numbers of young men entering the profession perhaps accounts for this; then, too, the greater uniformity of the standards by which operations are judged, and the more definite apprehension of just what is required in operations, have led to a quicker appreciation of the suitableness of appliances to the purpose for which they are designed. All this, of course, affects more or less directly the question of preventing decay of the teeth. The treatment of sensitive dentine at one time occupied a large part of the time in our Association. Now, we seldom hear it mentioned. The management of this affection has become comparatively easy. There are so many obtunding agents that we give ourselves no concern about it. Some of the best of these have been introduced within the last two or three years. My attention has been called to menthol for antiseptic purposes. I have been using it also for sensitive dentine. It serves a valuable purpose. I dissolve the crystals to saturation in alcohol and tincture of aconite, and apply to the superficial decay. I have used it for two or three months.

Dr Terry.—I have been experimenting for twenty years in the direction of preparing a good obtundent of sensitive dentine, and I have been many times disappointed. After long investigation I have succeeded in compounding a medicine, by the use of which an exposed pulp can be saved in nine out of ten cases. By using this preparation upon an exposed pulp, following its use with a capping of iodoform, and this with a cap of oxyphosphate,good results may be expected. It may sometimes be necessary to bleed the pulp slightly. I have used it in my own practice about two years, and have never lost a case.

Dr. Berry.—For obtunding sensitive dentine I use German creasote, which is superior to the American, and contains no carbolic acid.

Dr. H. A. Smith.—Dr. Terry's obtundent has been used with satisfactory results in the infirmary of the Ohio Dental College.

Dr. Corydon Palmer was the first to direct attention to the fact that the first annealing of gold foil is the best. Every subsequent annealing seems to impair its value for dental filling,and to destroy certain desirable qualities. During the past year I have confined myself to the use of unannealed foil, making it relatively cohesive as required. I am satisfied that is the proper way to work with foil. The students in our college have used it in accordance with the idea I have advanced, and I think they almost unanimously confirm Dr. Palmer's theory.

A Voice.—Are you able to make it sufficiently cohesive for large contours?

Dr. Smith.—I was for a long time apprehensive that for such cases it could not be as good as cohesive foil. But experience has reassured me. Strips of No. 4, soft foil, annealed and rolled into a rope, may be worked into the cavity without so great liability of the instrument passing through it. It seems to me that I can use it more rapidly, and that less force is required to consolidate it.

Dr. Van Antwerp.—I have been using unannealed, untrimmed, foil, and like it very much better than cohesive foil. It feels soft, like buckskin, and has none of the harsh, crisp qualities of cohesive foil. I have made heavy foil in my rolling-mill by placing gold between sheets of paper and rolling it down. It makes a magnificent heavy foil. I have frequently used aqua-regia to etch the surface. Of course the acid must be afterwards removed. I have noticed that a second annealing renders the gold harsh.

Dr. Jay.—I avoid a second annealing. Use soft foil as such, for filling in suitable cases. In all cases I want to anneal the foil myself.

Dr. Taft.—Recommended for large shallow cavities the use of a thin plate of pure gold,made by melting foil scraps and rolling them down to No. 28 or 30, Stub's gauge. Solder on to this a staple, and attach with cement. The question what to use for very soft, frail teeth is oftentimes a perplexing one. I sometimes say to myself, "What can I do?" I know it will not do to use gold. I have been experimenting wiih materials to use next to sensitive dentine under gold filling. My object has been to fill up those imperfectly formed tracts, which are shown under a magnifier in many soft teeth. I think varnishing the walls of such cavities is a step in the right direction. Oxyphosphates, tin, etc., are all very well to use, but after all,we do not want to be restricted to such temporary expedients. We do not enjoy doing these operations over and over again, and again.

Dr. Callahan.—I have used Robinson's felt foil, covering with gold, in approximal cavities. I like the results better than in the cases of many all-gold fillings I have made. This material, where it is not exposed to wear, sometimes discolors. But after a long time I have discovered no sign of softening around the edges of fillings made of it.

Dr. J. Taft.—I have used tin to a limited extent. My impression is that the Globe tin foil of the S. S. White Co. is the best. It has a very peculiarly frosted or crystallized surface,and works almost like a plastic. I value it very highly.

Dr. Wright.—What number do you use?

Dr. Taft.—About No. 10, I think. It works down like a piece of chamois skin,holds its place well,and takes a smooth finish. I have never used the Robinson foil.

Dr. Callahan.—There seems to be fear on the part of many who are trying this material that it is not very strong. I have used it for two years, and have had no failures.

Dr. Van Antwerp.—Can you make gold weld to it?

Dr. Callahan.—Yes.

Dr. Emminger.—Stated that in order to make the gold weld to it a layer of the felt foil should be laid upon the portion previously condensed, and upon this the gold should be tacked, and the two pieces worked down together.

Dr. Taft.—I am glad to hear that, for I am told that some have not succeeded in making gold weld to it.

Dr. Campbell.—I have succeeded by using No. 30 or 40 gold, but use sharp-pointed pluggers. Unless it is thoroughly well condensed it is not reliable.

The next subject opened for discussion was: "What valuable medicinal agents have been introduced into dental practice within the last three years?"

Dr. Taft.—The peroxide of hydrogen is one of the agents recently employed in dental practice about which inquiry is made. My actual experience with it is limited. It is a very good disinfectant. Disinfectants act by breaking up the elementary or binary constituents of a decomposing substance, and so render them inert. It is, however, of little value as an antiseptic. A small amount of vitiated matter will sometimes keep up decomposition,and a disinfectant will restore the affected tissues to healthy action. The offensive matter is the cause of the irritation, and the vital function is often fully restored by the free use of a disinfectant. Peroxide of hydrogen is a disinfectant, but not an antiseptic. Some may attribute the return to healthy action of the affected parts to its antiseptic effects, but that is not always necessary.

Dr. Smith.—How does peroxide of hydrogen act?

Dr. Trft.—By the liberation of oxygen, and its combination with the offensive matter in the abscess destroys its offensive character.

Another agent to which I before referred as a remedy for sensitive dentine, is worthy of mention as a remedy in facial neuralgia. That is menthol. It is distilled from the oil of peppermint. A few crystals placed in a watch-glass, moistened with a drop or two of chloroform and tincture of aconite, and applied to the face,often act beneficially. A convenient way to use it is to make it into an ointment with vaseline, and apply over the track of the aching nerve. I have also used it in my own case in the treatment of lumbago. It affects the sensory nerves immediately. It should be prepared immediately before using, to prevent the chloroform from evaporating.

Salicylic acid is another agent—not very new, it is true—which is useful in devitalized teeth, where there is a low grade of inflammatory action. It is a disinfectant, and an antiseptic also, to some extent. Do not apply it where there has been recent or acute inflammation about a root. In some such cases, I have found it aggravated the trouble. Where there is a low, chronic form of irritation kept up by fluids and gases, I know of nothing better to use than salicylic acid. Iodoform is also a good disinfectant. Its odor is very objectionable. That may be masked, but it is a question whether it can be done without impairing its efficiency. Recorsin is also good, and is less offensive than iodoform. Oil of eucalyptus is an antiseptic, and to some degree a disinfectant also. It may be used where a stimulus is not required. I do not think it has any advantage over other agents used; I doubt whether it is better than thymol, which has long been used. Listerine is simply a disinfectant. It may be used for deodorizing about the office,or in the mouth. I have my patients wash their mouths with it sometimes, when their breath is very offensive. It is efficient, and is easily applied. I use a little, a teaspoonful, in a glass of water, for rinsing my own mouth at night. It is better for the uses for which it is designed than permanganate of potash. The latter agent is objectionable on account of its staining.

Dr. H. A. Smith.—The remedies Dr. Taft has mentioned are all valuable. I beg leave, however, to differ with him as to salicylic acid. It destroys tooth substance. I have found that it acts to disintegrate tooth structure. Dr. Taft stated correctly that it was the oxygen in the peroxide of hydrogen which is the active principle. Years ago it was used for bleaching teeth. It is nothing new. A great many medicines are put upon the market as disinfectants. It is not wise to rely implicitly upon any single one of these in all cases. Carbolic acid and glycerine are often very efficient. I give permanganate of potash the preference over Listerine for bad cases. Creasote, I think, deserves a high place in the list of dental remedies. It prevents putrefaction, but as a deodorizer we know but little of its virtues. Carbolic acid, we know, will sterilize beef, kill the spores, prevent fermentation, and, with the exception of bi-chloride of mercury, it is the best agent for arresting putrefaction. Dr. James is the only dentist I know of who has dared to use this latter agent.

Dr. James.—It is true that I did venture to use it in one instance

[Laughter] and the patient still lives. Not only that, but I think the agent accomplished just what was wanted.

Voices.—How did you use it? What did you use it for?

Dr James.—I used it to cure an abscess, in accordance with the suggestion of a physician. One grain to the ounce of water, pumped into the root-canal on a broach.

Dr. Van Antwerp.—That would be about one-fifth of one per cent. Physicians are using it in the proportion of one part in eight hundred parts of water.

Dr. Smith.—I think that if we can use this safely we have a good thing. Its stimulating property will prevent fermentation or putrefaction. It kills like "sure-shot."

Dr. Wright.—Do not die in the house. [Laughter.]

Dr. Van Antwerp.—It is interesting to hear that the dentists are giving this remedy their attention. The medical profession are experimenting to kill the bacillus by inhalation.

Dr. H. A. Smith.—It is claimed, you are aware, that in the use of some filling materials peculiar therapeutic effects are produced, whereby dental caries is most certainly arrested. I recall some recent experiments of Koch, than whom there is no better authority, to determine the value of the salts of mercury for disinfecting, especially the bi-chloride of mercury. Of the eighteen drugs experimented with, corrosive sublimate stands first in value as a true disinfectant. This bi-chloride, he found, not only retards putrefaction, but actually prevents it. An aqueous solution of five per cent. or less, kills the spores and prevents their further development. The statement is frequently made that whenever amalgam is used as a filling material, a chloride of mercury is formed in the mouth, which frequently produces the physiological effects of the metal, and hence the use of amalgam is denounced. On the other hand, it is stoutly denied that any constitutional effects ever result from the use of amalgam. The fact cannot, however, be denied that amalgam being placed in a tooth, the walls about the filling gradually assume a dark hue. This discoloration is ascribed to a deposition of some salt into the dental tubules. It is believed, as I have stated, that chloride of mercury is so deposited. If this be present, may not the so-called therapeutic action of amalgam fillings be due to the marked antiseptic and disinfecting property of the corrosive sublimate? A solution of this salt is white, whereas the color of the tooth is changed to a blackish hue. But, since the filling leaks, may not the discoloration be attributed to the presence of other salts of the metal? for example, sulphuretted compounds? It is true, probably, of nearly all the alloys in use, that they leak, and yet they have very good tooth preserving qualities. This is indeed, a common feature of several of the plastics—an unexplained phenomenon--that they are not water-tight, and still teeth are saved by their use. It has frequently been stated upon this floor that caries never recurs about an oxychloride of zinc filling, so long as the filling remains intact. And yet, Prof. Flagg, who may be regarded as excellent authority, says the oxychloride preparations shrink notably. So also of the gutta-percha preparations. Indeed, when we consider the very attenuated form which water may assume, it seems almost incredible that water may be almost absolutely excluded from the cavity, even by gold filling, especially if the operation be difficult or complicated. How exceedingly thin must be the film of water that floats away in the air in the form of a soap-bubble! A recent calculation by Sorby shows that 3,700,-000,000,000,000 molecules of water are contained in one cubic thousandth of an inch! (Three quadrillions, seven hundred trillions!) These figures are surely sufficient to alarm those of us who practice conservative dentistry on the principle that teeth are saved by excluding moisture from the cavity of decay.

Dr. Taft.—I opine that the answer will be found in this explanation : The vapor of mercury is exceedingly volatile; it is almost impossible to make the joints of a retort so tight that it will not pass through. It penetrates the dentine of the tooth frequently, and discolors it. It passes into the tubules and oxidizes, and the particles of oxide are larger than the particles of vapor, and so the ends of the tubules become closed by them. These particles thus form a shield against the agents producing decay, and the result is their effectual arrestation. It is stated that some amalgams do not thus blacken the dentine. That may depend either upon the fact of the teeth being very dense, or the amalgam may be so prepared that the white vapor of mercury does not escape, and so there is no penetration and subsequent discoloration of the tubules. But notably soft teeth and the teeth of young persons are liable to become black when amalgam is used.

Dr. Smith.—You will usually find free chlorine in the mouth in such cases, and what then prevents the formation of bi-chloride of mercury? I think there *is* that combination.

Dr. Taft.—I hardly think so. Oxygen is in far greater abundance, even granting that free chlorine exists, and it asserts its affinities first of all. I do not imagine that bi-chloride of mercury is ever produced by the presence of amalgam fillings. But if it is, it is one of the strongest arguments against using amalgam fillings that could be advanced. That would prove conclusively that amalgam is a subtle poison, and its use might then well be characterized as criminal. But always precisely this formation of the oxide of mercury precludes the possibility of any other salt being formed.

Now again, as to the distinction between a disinfectant and an antiseptic. Oxygen is the chief agent in decomposition, and any agent which will prevent the occurrence of that process is called a disinfectant. A disinfectant acts in one or two ways; it either takes away one of the elementary constituents, of the offensive matter, or it separates those constituents, and leaves them free to form new compounds of an inoffensive nature. What is decomposition? You destroy the vitality of a tissue, and oxygen presently asserts its affinities, being no longer held in abeyance by the vital force,and the tendency is to dissolution of the tissues. Since oxygen is a necessary factor in the case, if you exclude it from the surface exposed to its influence you prevent decomposition. If, for example, you apply carbolic acid, it coagulates the albumen of the tissue, forming an eschar, so that oxygen has no access to the tissue, and no decomposition occurs. That is a part of the antiseptic process. Whether it be by a solid or a liquid covering, the result is the prevention of decomposition, provided the germs be effectually excluded.

Dr. How.—My idea of the distinction between a disinfectant and an antiseptic is like this : A disinfectant is a policeman who steps in and arrests one of the offending agents after the disturbance has fairly commenced, and so breaks up a row. [Laughter.] The antiseptic is another policeman, who takes possession and preserves the peace, on the first sign of an impending disturbance. One is corrective, the other preventive.

Dr. Smith.—Admitting, as has been asserted, that oxygen gets to work more promptly than do other liberated gases in the mouth, it is beyond controversy that other gases seek their affinities just as positively and unerringly, if less conspicuously. Now, why is it presumed that chlorine is an exception in this instance? Those who accept the theory of the formation of hydrochloric acid in the mouth as an agent of decay, do not hesitate to speak of the presence of free chlorine in the oral fluids. Why will not this unite with mercury if it be present? I am not yet convinced that that does not occur. It is well known that English amalgam blackens dentine in a very marked manner. Sullivan's amalgam does this. Now, an amalgam which blackens *reasonably well* is better than one which does not blacken at all.

Dr. Taft.—There occurs to me an insurmountable obstacle to Dr. Smith's suggestion—that formation of mercury cannot be sufficiently volatile to pass into the tubules. The only way, indeed, that I can see how this blackening is effected, is by the infiltration of the vapor of mercury. Chlorine has a stronger affinity for the dentine than for mercury.

Dr. Hoff.—Peroxide of hydrogen has proven very effective in my experience of six months' use of it. It has taken the place of creasote. I like it because of the facility with which it can be applied. Used in a syringe it does not, like other agents, cauterize the soft tissues. I used it in one instance in treating two molars about which the process had been lost by necrosis. Could not get through the roots, filled with oxychloride of zinc,and treated the parts externally by injections with a syringe,once repeated. The cure is apparently complete.

At the conclusion of the discussion, the Committee on Obituaries reported a resolution on the death of Dr. T. L. Buckingham, as follows:

This Association desires to place upon record its sense of the great loss which the profession has sustained by the death of Prof. Thos. L. Buckingham. We may not hope by any form of words to express the value of his faithful and life-long devotion to the educational and practical interests of the whole profession, or of his most estimable character as a man, but we offer this heart-felt tribute in token of our sincere appreciation of what he has wrought for us. We wish also to convey to his bereaved family our sympathies with them in this time of their sore affliction and irreparable loss. The Secretary is instructed to transmit to the family a copy of these resolutions. In behalf of the Mississippi Valley Association of Dental Surgeons, in annual association at Cincinnati. March 6, 1884.

W. S. HOW,
G. W. SMITH,
J. TAFT,
Committee.

The annual election of officers of the Association for the ensuing year resulted as follows:

President—Dr. William Van Antwerp,	Mt. Sterling, Ky.
Vice-President—Dr. F. W. Sage,	Cincinnati, O.
2d Vice-President—Dr. A. L. Emminger,	Columbus, O.
Recording Secretary—Dr. A. G. Rose,	Cincinnati, O.
Corresponding Secretary—Dr. A. Berry,	Cincinnati, O.
Treasurer—Dr. Frank Hunter,	Cincinnati, O.

AMERICAN DENTAL ASSOCIATION.

Extracts from Discussion on Artificial Dentistry.

Dr. W. H. Trueman.—Within the last few years there has been shown a strong disposition on the part of mechanical dentistry to encroach upon the operative branch. This is probably an outgrowth of the increasing desire of the profession to preserve the usefulness of the natural teeth as long as possible. This is seen in the increased thought given to pivot-teeth; and still more, in the efforts made to dispense with partial plates, and replace them with appliances rigidly fixed to roots, or to the remaining teeth, or to both. It has indeed become a question where to place the dividing line between mechanical and operative dentistry, as these appliances, to be really successful, demand the best skill of both branches combined.

The advantages of a denture that is firmly fixed and leaves the the mouth entirely free are very great. It is the nearest approach to the organs it replaces we can obtain; but there are also disadvantages associated with such appliances not to be overlooked. Unless great care is used in their construction, they will prove very temporary and a source of discomfort as long as they are retained. The difficulty of keeping them clean and free from the accumulation of food is a serious drawback to their usefulness. Where roots can be used and the fixture arranged without injury to any of the remaining teeth, there is no question that to make the attempt is good practice. But are we justified in destroying the pulp of a sound vital tooth? Are we justified in even cutting into a sound tooth to secure anchorage for such an appliance? Would it be good practice, for instance, where a lateral was missing, to destroy the pulp of a perfectly sound adjoining canine, cut off the crown, and mount two teeth on its root; and, perhaps, also cut a cavity in the central to give the fixture additional firmness, as I am told is being done—I am pleased to add—by dentists who advertise extensively, for I cannot conceive that a real dentist would ever commit so great an outrage?

We may often to advantage make one root support two or even three teeth where the conditions are favorable, as I have done several times; but when we make an appliance that is rigidly fixed to two or more roots or teeth, is not the risk of failure largely increased? We all know how uncertain a pulpless tooth is. Is it not a great risk to rigidly fasten several of them together with an apparatus that is not readily removed? What will be the probable result if any of them become inflamed, as they are so liable to do? And again, the advocates of bridge-work, as it is called, urge the attaching of eight or ten teeth, or even an entire denture, to four roots. What will be the probable effect on the four roots thus made to do the work of two or three times their number? It seems to be one of those things in which it will be well to advance slowly. It may be practicable. I saw two such arrangements in the same mouth, constructed in Paris about 1856. On each jaw were about ten teeth, mounted on a heavy half-round gold wire, and rigidly fixed to about four roots. The roots had been plugged with wood, and gold pivots soldered to the fixture driven into it. In each jaw were several natural teeth, but the denture had no connection with them. Nearly all the roots of the missing teeth were in; they had been filed down, and the wire rested upon them. I understood from the patient that she suffered very much for several weeks after they were inserted. When I first saw the case, it had been in place about twenty years, had never been removed, and had given entire satisfaction. It was lost some five years afterwards from recession of the gums loosening the roots. In that case, there is no doubt the patient had a far more comfortable and satisfactory denture than plates would have been; but, I must add, the odor from the roots and the accumulation of food the patient was unable to remove, was very, very vile.

Bridge-work is not to be utterly discouraged; in skillful and discreet hands its capabilities are great, and so long as it is confined to roots or teeth of little value, it can be made to relieve the patient of the inconvenience of a plate—at least for a time—make a more serviceable denture while it lasts, and if it does hasten the loss of the roots, it leaves the mouth in no worse condition for a plate than it found it. When we see how much has been done to make pivot-teeth more permanent and cleanly, who can say what persistent effort may not do in that direction in the future?

Dr. Stockton.—I hope very much that the other sections connected with this association will be able to promulgate knowledge among the members of the profession and the world at large, so that very soon there will be no occasion for a section on artificial dentistry. It is difficult now to discern just where the line between operative and mechanical dentistry should be drawn.

There is one fact brought to notice by Dr. Trueman, which, it seems to me, should receive the condemnation of this intelligent body, and of all other enlightened dentists. It is this: I understand the practice to be, when the loss of one or more teeth has been sustained, to advocate that an adjoining tooth, sound and useful, shall be sacrificed—cut off—and upon its root the two or more teeth be placed, in order to avoid the use of a plate.

My attention has been called to a new mode of holding in the mouth an entire upper denture. It is to do away with the central suction cavity, and to secure it upon the alveolar ridge. I present the plate for your inspection. The inventor tells me he has tried it in a number of cases, and there is no difficulty except for a short time—a day or two—when he has an entire adaptation of the plate to the mouth. I am inclined to think very favorably of this. I remember the case of a prominent preacher who had to have a set of teeth made about every six months, and he said to me that he was afraid he would have to give up preaching. The plates got loose. I made him a plate without any suction cavity, and from that time to this I have never had to change it. I believe a perfect adaptation of the plate to the mouth is a great deal better than depending upon a little place in the centre to retain it.

Dr. Bodecker.—About six or seven months ago, at a meeting of the New Jersey Central Dental Association, Dr. Timme, of Hoboken, exhibited a hydraulic press, invented by Dr. Robert Telschow, of Berlin. It appeared to me that this was an exceedingly good idea, and I determined that the first opportunity I had I would use this method. Dr. Timme has lately struck off two gold plates for me with the press. The particulars of this process are as follows:

The plaster impression is taken, and into this a compound of sulphur and plumbago (Spence's metal) is poured, which melts very quickly, and very quickly hardens. This is removed from the plaster impression, and a gold plate is pressed over this with the fingers as well as it can be done; or, a zinc die is made, and over this the gold plate is roughly hammered, as the Spence metal will stand any amount of pressure but no hammering. The gold plate and a piece of rubber which holds it in its place are put into the hydraulic press. The press will force it home with greater accuracy than I have ever seen accomplished by any other process. The pressure is about eight hundred atmospheres to the square inch. I have seen a good many plates fitted to the mouth, but I have never seen any that fitted so perfectly as those made by the hydraulic press.

Dr. Priest.—The method of pressing plates into form has been advocated before this association at a previous meeting. I think a better way is to cut the plate near the centre of the anterior portion, allowing it to lap as it is bent into shape, first forming it in the palatal arch (after cutting), which will allow the metal to move laterally; and with a die made by pouring lead into the arch of the zinc die, making what is often called a frog, then placing tough paper or thin cloth at each side of the plate, it can be easily and quickly driven, and made to approximate the form of the palatal arch, when the remaining portion can be readily shaped over the alveolar ridge; the lap reduced to the proper width, the edges beveled, and, after it is quite well fitted, soldered. If done nicely, and with fine solder, it will be hardly thicker than the plate; and, if properly finished, will not melt or flow during any subsequent heating. I consider it necessary in forming all "suction" plates to make two sets of dies (and sometimes the third), to produce a perfectly formed plate.

Dr. Kingsley.—I observe among those present some gentlemen who heard me speak fully upon my present subject—"Articulation and the Mechanism of Speech"—years since, and I have to ask their indulgence for some things I shall say which to them may appear ancient history. To such I would say that there is really nothing new in what I shall present, for the years that have passed have only served to prove by repeated demonstration that the opinions I then advanced were true.

The physiological and philosophical origin of articulate speech lies in the vibration of the vocal chords, which creates vibrations or waves in the passing current of air, and such waves reaching the ears of the hearer produce the effect we call sound. Sound and voice may here be used as interchangeable terms. The sound produced by the vocal chords may be one in tone, note, and key, but in passing through and out of the mouth it becomes changed by the alterations in the form and size of the buccal cavity. The one note produced when the mouth and the fauces are wide open is the vowel *Ah*, and all the other vowel-sounds which are heard in any language are but modifications of the sound *Ah*, made as above described.

In the English language we have five distinctly marked vowel-sounds, but the division of the one note, *Ah*, into the five vowels only, is more arbitrary than otherwise.

By sounding each one of these vowels as named separately and distinctly, beginning with *O O* and continuing with *O*, *Ah*, *A*, *E*, and then repeating the same order more rapidly until there becomes one continuous sound, it will be seen that the division into five sections or vowels is entirely arbitrary—a matter of convenience and a concession to unappreciative ears. If our ears were as finely attuned as those of some of the lower animals, this cycle of sound might have fifty divisions or vowels instead of five, but for the general purposes of spoken language distinctions in vowel-sounds should be strongly marked, and more than five are not likely to be appreciated. These five sounds, together with interruptions, make up in their almost infinite combinations the whole of spoken language.

The interruptions or stops we call consonants, and were it not for the liberal use of consonants any spoken language would be very limited in its scope and expression.

The effect of the consonant is very simply illustrated by sounding the vowel *Ah* and stopping the sound by shutting the lips; if the vowel is continued on opening the lips, *Ah* becomes *Bah*, and in a similar manner all consonant sounds are produced.

Cleft-palate patients are generally able to produce the vowel-sounds without difficulty, but many of the consonants are entirely wanting, and with such a fissure it is impossible to produce them. Some of the consonants depend solely upon the integrity of the normal palate, and others even are more or less affected by its rupture.

In many instances so large a number of consonant-sounds are imperfect that the speech becomes absolutely unintelligible. It is then that an artificial palate becomes a most beneficent provision.

* * I am annoyed from time to time that real knowledge makes so little progress. More than twenty years ago I discovered that the surgical operation of bringing the sides of the fissured palate together, no matter how perfect the union might be, did not produce perfect speech, the reason being that the newly-formed velum is too short to reach the posterior wall of the pharynx, and by thus closing the passage to the nares enable the patient to make the defective consonant-sounds. There is a lack of tissue or material in the remnants of the palate when cleft, to enable surgery to both bridge the fissure and get sufficient length for proper articulation. The surgical palate is too short *and always will be.* I have preached that doctrine over and over again, and when I could get the ear of a scientific man long enough for him to thoroughly understand what I meant by it, he was always convinced, so much so that in every instance where a surgeon had been sewing up cleft-palates, he recognized the cause of failure and abandoned the operation. Not a distinguished surgeon in New York City will operate for cleft-palate, because he does not believe he is doing the patient any good.

I will repeat the statement, that unless there is absolute closure of the space between the soft palate and the posterior wall of the pharynx, distinct speech, as we have it, is impossible. I have resorted to mechanism to supply the defect; but with all that has been accomplished in remedying the difficulties in the way of perfect speech for this class, I am obliged to say that I have rarely seen a cleft-palate patient in whom there was not a slight peculiarity of *voice*, even after the best service that was in my power had been bestowed. This peculiarity is a peculiarity of *voice* and is the result of a different resonance, caused by the abnormal naso-pharyngeal cavity, and is likely to be always associated with a mechanical appliance. It does not always occur, but when absent is probably the result of accident rather than design. No one can with certainty overcome such abnormal resonance except by repeated experiments upon the same individual, and the experience gained from one case might not apply to another similar one.

This peculiarity of voice (which the speaker illustrated by speaking for a moment with one nostril closed) must not be confounded with indistinct articulation or enunciation. I have seen scores of patients wearing artificial palates whose distinctness of utterance was quite the equal of any one in this room. In fact, there are many persons present taking public part in the proceedings whose articulation is more defective from a critical stand-point than that of many artificial palate patients.

The kind of apparatus best adapted to produce such results is not always the same, in shape, material, or principle. I believe, all things considered, that the principle of most universal application, the one most likely to insure the best results, is that of an elastic artificial velum, filling the cavity and under control of the muscles in the adjoining tissues. Such a velum more nearly resembles the natural palate in character, function, and action, than any other appliance which has yet been constructed. With it the buccal-vocal tube or the nasal-vocal tube may be changed in form and resonating power, as the velum comes to be under the control of the wearer, and only under such circumstances can the most perfect articulation be learned. Nevertheless, I have seen patients who have so overcome their defective articulation by wearing an elastic velum, that they could still articulate well when a non-elastic apparatus was substituted. I have therefore in many cases substituted an obturator of peculiar form and with excellent results. Such obturators or artificial palates are sometimes made of gold, sometimes of platinum, but generally of vulcanite. Their peculiarity consists in a hollow bulb which occupies the naso-pharyngeal cavity and adapted with great care to the contracted condition of the surrounding muscles.

With such an instrument the burden of articulation devolves upon the action and education of the constrictor pharyngeal muscles and requires more skill to articulate all the sounds of our langage properly than is required with an elastic velum or with well-formed natural organs.

Dr. Thomas.—Does not the speech improve with the continued use of the apparatus?

Dr, Kingsley.—There will be no improvement of the speech at first. By experience we learn to know when the apparatus for a given case is what is required to enable the patient to acquire correct articulation. If you purchase a piano, you have no guarantee from the maker that you can make music. The instrument may be as perfect as it is possible to make it, but you must learn to play upon it. So with the apparatus for the cleft-palate patient. It may be just what is required to enable the patient to articulate properly, but as to how long it will require for the patient to learn to use it I do not know. It depends largely upon the aptitude of the student. Some learn much more quickly than others.

But in all cases there is no pronounced improvement immediately; it is at first almost imperceptible, and may go on gradually for years. Some patients will speak exceedingly well in a few months, while others may never overcome the bad habits formed with deficient natural organs.

The age is an important factor in the problem, as the younger one begins to break up bad habits of speech or attempts to acquire a new language the more hopeful the result.

Dr. Watkins.— I have a case in practice of a lady about fifty years of age, who has been an invalid for seventeen years. The molars and bicuspids of the upper jaw have been removed for a long time. The alveolar process is entirely absorbed, and the mouth almost flat and very small. I inserted an upper set on rubber, and to my great satisfaction I secured a beautiful suction; the teeth seemed to stay in place very well. The process being so much absorbed I made the teeth pretty long. When she went to eat, however, the teeth would wobble all over her mouth. She tried them for two or three months, but could not seem to improve upon them, so I told her I would make her another set, and I did, and in this case I made the teeth short, as I thought perhaps the length of the teeth had something to do with the difficulty in using them. I have now obtained a suction that I cannot break by taking hold of the front teeth, yet when she attempts to eat the teeth wobble in her mouth as before, and the suction breaks the moment she tries to bite anything with her side teeth. 1 would like to have some gentleman tell me what to do in this case.

Dr. Stockton.—I think if the doctor will make the teeth so that there will be about the thirty-second of an inch between the upper and the natural lower teeth, she will be all right. She strikes the natural lower teeth somewhere and tips the plate.

Dr. Harrouin.—I think there might be another difficulty, owing to the yielding of the soft parts under the plate, and the plate not being fitted properly at the sides. If this is the case I would trim out the plaster model so as to equalize the pressure.

Dr. Dickerman.—I think there might be still another difficulty.

The leverage may not be on the line of the alveolar ridge.

Dr. Horton.—There may be another difficulty. I often find such trouble from there being soft places. There is a soft part, under the plate somewhere, where it rests well enough when she it not eating.

Dr. Cravens.—At the age of fifty years, the natural teeth have become smooth on their occlusive faces. If you put in teeth the forms of which represent the age of the patient, you will probably have no trouble. A person of fifty years cannot chew with artificial teeth that bear cusps. The grinding faces should be ground plain for the aged.

Dr. Morrison.—I would like to make a few remarks in regard to artificial crowns. I want to enter a protest against the method of cutting the crown of teeth so heroically. I think a great mistake is made by cutting the whole crown down to the margin of the process or the margin of the gum, and then adjusting the crowns so as to crowd upon the process."

I have noticed several appliances, made for cutting the roots of the anterior teeth, by which pivot-teeth are inserted upon correct tenoning principles. They cut a tenon on the root and adjust upon it a metallic cap, which is made by machinery to fit accurately. I have no respect for a tooth of that kind put on in that form. It has no regard for the festoon of the gum, and if you carry it to the gum on the labial surface it must be very much under the gum on the approximal surfaces. All of the root should be preserved and as much of the crown as possible. Then restore the remainder with a metallic crown or section of a crown, making strong and durable work, but never cut away a half or third of a natural crown to substitute a porcelain one.

Dr. E. Parmly Brown.—One of the most objectionable things to me in the past in mechanical and operative dentisty has been the making of artificial crowns, and this branch of dentistry is the only one that I have neglected. I have been experimenting for nearly twenty years, and have at last succeeded in producing a crown that will accomplish all that could be desired. I can conceive of no root of a tooth, dead or alive, that is fit to remain in the human mouth that I cannot crown with my system.

The first set of appliances, on which I have received a patent, I will exhibit to you, and if there are any gentlemen here who have any objection to patents, I will immediately sit down.

(The doctor illustrated by the blackboard his method of applying the crown).

Dr. Howe also illustrated his method on the blackboard and by means of his instruments devised for this particular work.

Dr. Barrett.—I want to present an idea, not original, but of value in the setting of gold crowns. Copper is rolled down quite thin, and a band three-fourths of an inch wide wrapped about the root of the tooth and forced up under the gum. A ligature is passed around both, the copper band is burnished down, and the ligature drawn tight. This copper band will now fit just about as we want the gold band to do. Plaster of Paris is then inserted in this, forced up against the end of the root, and permitted to set. Take it off and if you use Babbit-metal a piece of paper wrapped about it will lengthen it out sufficiently, when the melted metal may be poured into it, and thus a perfect model of the end of the root will be secured. That part that is inserted in the copper is the exact reproduction of the root of the tooth. The model will perhaps need a little dressing down with a file, when the gold band may be fitted about it and soldered, thus avoiding the necessity for the annoying and painful trying on in the mouth. I believe this marked improvement was devised by Dr. H. A. Baker, of Boston.—*Transactions of Am. Dental Association*, 1883.

SELECTIONS.

DEFECTIVE STRUCTURE OF TEETH.

BY W. H. EAMES, D. D. S., ST. LOUIS, MO.

The anomalous forms of teeth known as rocky, furrowed, ridged, or cribriform and pitted enamel, so frequently met with, seem to have received little attention from writers on kindred subjects. Little, if any advance has been made within the past century in the way of settling the question as to the true cause of these various abnormal formations. As long ago as 1757, Bourdet, in speaking of these anomalies, stated that, in his opinion, they were the result of an interrupted development, due to constitutional causes, disturbances which affected the epithelial structure, exanthematous diseases, measles, etc.; and all writers, from that day to this, so far as I have been able to learn, accept his conclusions in the main. They all agree that it is the result of arrested development.

Again, these various forms have, until quite recently, been included in one class, although differing materially in general and histological characteristics. Dr. Jonathan Hutchinson has called attention to two distinct classes, which he described under the head of mercurial and syphilitic teeth, at the same time recognizing each as the result of arrest of development. The mercurial constitutes the larger class, the effect of mercury upon the teeth being a noticeable fact, and the more common cause. Next to this he places syphilis. " Other causes may produce a similar result, but in a less marked degree, as seen in the slight markings and pits so frequently met with." His theory has been pretty generally accepted, notwithstanding the noticeable fact that many well marked cases of both forms, mercurial and syphilitic, are mentioned, where no trace of mercury or syphilis, was present, and also that stomatitis, which is said to be the result of this cause, and which produces these effects upon the teeth, could not have been present at the time the teeth was in a formative stage.

C. A. Harris, " Dental Surgery," page 397, says: " A constitutional disease interrupts the secretion of the lime salts deposited in the enamel cells, or secretory ducts of the enamel membrane for the formation of the enamel fibres. The secretion of the inorganic constituents of the enamel being interrupted for a short time, the horizontal row of cells in the enamel membrane into which it should be deposited will not be filled, consequently they will waste away, leaving a circular row of indentations around the crown of the tooth. As soon as the constitutional effect ceases, the secretion of earthy salts will be resumed, and the other parts of the tooth will be perfect."

Salter, " Dental Pathology," page 14 : "Rocky enamel is, I believe, *always* associated with imperfect formation of the immediately subjacent dentine, and it is a manifestation and permanent record of depressed nutrition at a period of formation. It usually happens that when the dentine of the crown exhibits imperfect calcification, the enamel is imperfect at a spot corresponding with the external abutment of the imperfectly calcified layer, and exhibits the condition known as 'rocky enamel.' The converse of this is, I believe, constant, namely, that whenever a tooth exhibits rocky enamel it will be found that the dentine beneath the irregularities or pits, displays the conditions I have been describing."

Coleman, "Dental Surgery and Pathology;" page 55 : "Amongst the most common departures from the normal type are the so-called honey-combed teeth, the enamel of which has been so imperfectly developed that it is wanting, or almost wanting at many points. It most commonly takes an arrangement of parallel horizontal lines on the teeth, which, however, are not equidistant from the cutting surface on the crown of each, and therefore corresponds probably to certain periods in the development when these conditions prevailed, which prevented the perfect arrangement of the enamel fibres, or the disposition of the lime salts. The markings on the teeth afford a pretty correct idea of the time when the trouble took place, and inasmuch as the teeth are dermal appendages, it will almost invariably be found to have occurred at a time when the skin or mucous membrane was affected by some disease."

Wedl, "Pathology of the Teeth," page 142, states that "although the external layers present numerous pits, the internal layers towards the dentine are *invariably* found to be smooth. The depressions in the enamel present externally a wide opening, or less frequently are constricted so as to form a sort of neck, the entire internal surface is covered with enamel which may be of normal character, with the exception of a variation in the course or arrangement of the prisms. Teeth of such character, as have been described, are due to the disturbing causes which occur at intervals during the process of their formation and prevent the uninterrupted development. In proof of the periodical occurrence of a disturbing cause, may be cited the following: (A) Breaks are found in the enamel, each of which include a system of layers. (B) The fact that imperfectly developed dentine in the form of interglobular masses is intercellated and conforms in its deposition to the layers forming the coronal and radical portions. Hence may be inferred the occurrence of an interruption to the complete formation of the dentine. Moreover, the irregular disposition of the layers upon the internal surface of the dentine, favors the view of an interruption to its systematic development. (C) In regard to the cement the fact that its development is lessened so that only a thin coat is found covering the root."

Magitot, "Dental Caries," page 56 : "The explanation of the congenital alterations of the teeth belong. we repeat, to the history of the follicular evolution. They are due in fact exclusively to arrests or partial stasis at the very formation of the dental tissues. When there is no disturbance, either general or local during this particular period of dentinification, the phenomena taking place in a regular and continuous manner, the tooth at its eruption presents an exterior configuration and an interior composition, alike normal and homogeneous. But if, on the contrary, there happens during infancy a local lesion in the neighborhood of the follicle in the way of development, or a more or less grave affection of the general economy, eclampsia, eruptive fever or intestinal disturbances, there is observed some one of these slight imperfections of the crown, or a complete suspension of the formation of the enamel, and of the ivory shown by the characteristic furrows of erosion. The explanation we here give of the formations of the superficial and internal lesions, the constitutional erosion is not admitted by all authors. Some of them attribute them to a change of chemical nature, taking place at the very surface of the tooth during one of the phases of eruption at the moment when the crown, incompletely erupted at the surface of the pierced gingival border, becomes covered with abundant mucus, the result of hypersecretion under the influence of an intercurrent affection. A case in support of this theory is given. A girl nine years of age, a most marked case of erosion occupying the incisors and six-year molars, the remaining temporary teeth perfect, the whole of the diseased portion being absolutely devoid of enamel. The child from the age of two years had never been confined by any indisposition, but at the age of two years she had a severe attack of eclampsia, which for a fortnight had endangered her life. This epoch corresponds precisely to the period of dentinification of the eroded tooth, this having been completed at the time for the temporary teeth, and not yet begun for the rest of the permanent dentition."

Hohl, "Deutch Viertelj," (f. z., 1869(: Found a very abundant secretion of an acid saliva in a child seven years of age afflicted with congenital hydrocepalus. All the teeth were of a grayish yellow color, and smaller than milk teeth. The enamel was wanting almost entirely without any evidences of caries. In the cement and dentine there were to be seen numerous canals, and also gaps resulting from resorption, and in the latter was an evident disposition to a horizontal arrangement with numerous interglobular spaces." Hohl considers that in this case there was an arrest of development of the teeth and a decalcification of the same upon the outer surface.

My observations in this direction have led me to doubt the theory heretofore entertained, viz.: that all these anamolous forms are the result of arrest of the amelification of the enamel. The forms met with are so different, and the causes so far as I have been able to trace them from the histories of individual cases, so diverse, that they cannot be looked upon as the result of the one cause. Some of the objections to the accepted theory may be for the present briefly stated as follows: 1st. That the arguments used by writers on this subject are based almost entirely on the anatomical appearance of the teeth, while they may appear to support the theory when applied to some of the forms of these anomalies, may be used as well to disprove it when applied to other forms. Wedl, for instance, states that "the enamel, otherwise smooth, is frequently studded, like a thimble with numerous pits, *some* of which extend as far as the dentine, sometimes is traversed by transverse grooves, which are bounded by ridges." "In such instances, however, it is to be remembered that although the external enamel layers present numerous pits, the internal layers, next to the dentine, will be found to be invariably smooth." If we attempt to account for this appearance of the formation on the theory of arrested development with our present knowledge of the phenomena of amelification, we shall find it difficult to understand why the inner layer is found invariably smooth. The dentine, he also states, is found to be irregular in structure, corresponding with the irregularity marking the surface of the enamel. The cement also shares in the deformity. If we compare this statement with another, namely, that the furrows in the enamel mark a period of arrest and the ridges a return to normal action, and the portion of the tooth above the markings shows perfect development, why should the cement which is formed after the destructive periods have passed exhibit evidences of arrested development? These teeth show a series of lines or furrows, each of which according to the theory, indicate a disturbance of the epithelial structure; we must therefore have a series of disturbances equal in number to the markings on the teeth. Some of these markings would indicate a period reaching the formative or calcification period of the bicuspids, and yet they are seldom, if ever, affected. Pitted teeth, or pits in the enamel described by Wedl, so frequently met with, are not confined to the incisors or first molars, but are found in the bicuspids as well. Can this form of defect be the result of arrested development? I think not; certainly not in the sense it is generally understood, or as applied to other forms. Prof. C. A. Harris states that an interruption in the deposition of the lime salts in the enamel cells leaves a row of indentations around the crown of the tooth. As soon as the constitutional effect ceases, the deposition of lime salts is resumed, and the other parts of the tooth will be perfect.

If we examine the enamel organ during the period of amelification we shall not find the lime salts deposited in a single row of ameloblasts around the tooth, forming a line of complete enamel rods, but commencing at a point directly opposite the cusp a series of the cells become impregnated at the same time, and thus a sheet of varying thickness is formed. An interruption in the process would result in a break of the entire sheet; some of the rods would show the effect at the beginning of the process of amelification, others at the completion, while others would show it at intermediate points. No such evidences of interrupted development are seen in pitted teeth. The enamel fibres surrounding the pit are perfect throughout their entire length, and according to Wedl, the bottom of the pit is covered with a perfect sheet of enamel.

I am unable at this time to further indicate the objections which have presented themselves to the theory above set forth, but I hope at a future meeting to pursue the subject to the end of my investigations. I do not claim with absolute certainty to have found out the cause, but I venture to offer what seems to me to be a few resonable suggestions, in the hope that they may throw additional light upon a subject of prime interest to every member of the profession.

I regard the origin of the various forms of defective enamel, referred to, quite distinct as to time, some dating back to the formative period, while in others the change takes place after the part is completed. For example, the form described and figured by Wedl as isolated pits, frequently met with on the points of the cusps of biscuspids and other teeth, enamel otherwise perfect, owes its origin to a different cause from that which may have produced other forms. I regard this form as congenital in its origin, the absence of one or more of the ameloblasts from the epithelial layer of the enamel organ, and not in any sense due to a constitutional disturbance. The horizontal, furrowed form, described by Wedl and others, is not congenital, but is due to causes which affect the tissue after its formation is completed. It is due to the action of the "resorptive organ" which removes the roots of the temporary teeth and opens the bony crypt which encloses the permanent ones. Some of the forms may be the result of a constitutional disturbance, as cited by different writers.

Time will not permit of my offering any arguments in support of the suggestions I have here put forth, but if an opportunity be afforded me, I hope in a subsequent paper, on the "Origin of Defective Enamel Structure to more fully set forth my views.—*Trans. Ills. State. Dental. Society*, 1883.

NOTES ON REMEDIES.

BY DR. HARLAN.

Attention was called to the following remedies, and a few directions and suggestions relative to their use in dental practice. Samples of each were displayed on a table in the clinic room. Peroxide of Hydrogen ($H_2 O_2$), chloride of aluminum ($Al_2 Cl_6$), menthol(from peppermint), iodide of zinc($Z_n I_2$), oil of eucalyptus and iodoform, oil of cinnamon and iodoform, both of latter being prepared by taking a wide-mouthed glass-stoppered bottle, holding two ounces of iodoform and adding a quantity of the oil sufficient to make a paste a little thinner than cream. $H_2 O_2$ was recommended—

1st.—As a bleacher of pulpless teeth.

2d.—In the treatment of alveolar abscesses, for syringing the pockets in pyorrhœa alveolaris, and as a germ destroyer.

3d.—As a detector of pus, either in teeth affected with cold or blind abscess, or anywhere in the mouth where pus might be discharging, but not visible to the naked eye. The exhibitor thought there was a wide field for the use of this agent. (See Dental Cosmos, October, 1882, and October,1883.)

Chloride of Aluminum recommended as a bleacher of teeth in which $H_2 O_2$ will not bleach. Place dry crystals in cavity after the root has been filled, adjust rubber dam on the teeth, add a drop of water, allow the solution to remain one to three or five minutes. Use no alcohol or carbolic acid in the cavity, or other coagulator of albumen; wash cavity with a solution of bicarbonate of soda, dry it absolutely and fill half of the cavity with osteoplastics. If carefully used it will be found a good bleacher.

Menthol—recommended as an obtunder of sensitive necks of teeth. lx grs. to ℥ss alcohol; dry the necks of teeth affected and paint with the above solution daily for a week; use the same solution in facial neuralgia painted on the temple and behind the ear of the side affected; keep it away from the eyes. In excavating, place a few crystals in the cavity, and a drop of alcohol and cut fearlessly. Many times it will be found to alleviate the sufferings of some patients.

Iodide of zinc—has been used for more than two years to disinfect pockets of pyorrhœa alveolaris, in solution of 12–24–36 or 48 grs. to one ounce of water, once in four days until pus has ceased to flow on pressure or can be detected by H_2O_2. The granular is used to sprinkle on apthous ulcers, and to repair the *gingival margin* when ragged, slit or fungous; apply in full strength.

Iodoform and eucalyptus oil has been used to pack the pockets in acute pyorrhœa; pack daily for three or four days, when the inflammation will have subsided.

Iodoform and oil of cinnamon for the same purpose, and also to be smeared over the gums after excising during the eruption of wisdom teeth; likewise when they are turgid from impaction of tartar, or other cause; also it will be found useful to place on the gum over the root of a tooth when there is periosteal inflammation.

Cinnamon disguises the smell of iodoform pretty effectually. It may be used for a variety of purposes. Dr. Harlan said that too many dentists failed in accomplishing a desired object often because of unfamiliarity with remedies and lack of knowledge of why they were used. He said further, that this was an era of experimentation, and he hoped the few hints given out would be fruitful of results to the experimenters, and beneficial to humanity.—*Ibid.*

THE DENTAL SOCIETY OF THE STATE OF NEW YORK will hold its Sixteenth Annual Meeting at Albany, Wednesday and Thursday, May 14th and 15th, 1884.

OFFICERS.

President, L. S. Straw, Newburgh; Vice-President, Wm. Jarvie, Jr., Brooklyn; Secretary, J. Edw. Line, Rochester; Treasurer, H. G. Mirick, Brooklyn; Correspondent, W. H. Atkinson, New York.

JOURNALISTIC.

"Reading maketh a full man; conference, a ready man; and writing, an exact man."

THE Iowa State Dental Association, in Convention at Council Bluffs, on the 7th inst., recognized and declared the ARCHIVES OF DENTISTRY the official organ of that representative body of Dentists. We shall endeavor to continue to deserve the honor and distinction thus awarded us, and the professional brethren in Iowa have our thanks for their gratifying recognition of our labors thus far.

THE "GERM THEORY" seems to be the hobby of the day with both medical and dental writers. Much that is written is of great interest, and stimulates study in an almost unknown field.

OHIO STATE JOURNAL.—Dr. A. W. Harlan's translation entitled, "Dental Fees," gives a good idea of things outside of our own country. Every man should estimate the value of his own services, and fix his own fees. The custom that has prevailed in England and France, of accepting a uniform fee for every dental operation is a bad one. There is no good reason why an operation requiring a series of sittings for its completion, consuming much valuable time and a large amount of costly material, should be paid for at a price no greater than that of a simple operation which is performed in a few minutes and at a small outlay for materials used. Yet such has been the custom in the countries mentioned above, and this custom is probably one reason why plastics are so extensively used in both England and France. The introduction of American usages, as to fees, is doing much to correct this evil.

Dr. G. V. Black also translates the discussion at the annual Meeting des Vereins Schleswig-holsteinisher Zahnærzte in Bremen, on Herbert's method of filling with gold.

Dr. Florke says: "Herbert throws a mass of gold into the cavity, sets several large pieces in together (after the wedge system), therefore his fillings are not solid. If he puts them in, one by one, they will become hard and brittle. Has seen beautiful fillings from Herbert, but intimates that H. may have used a mallet on them." Menthue says: "I must confess that that which Herbert has accomplished with his new system has greatly surprised me."

Dr. Peterman makes gold fillings after Herbert's method. At first, did not succeed, for want of skill. Saw Herbert make a large and difficult contour filling. The work was easily and advantageously accomplished, although the side walls were very shallow. H. used a matrix, and thus changed an approximal into a crown cavity. Did not rub the filling continuously, and therefore did not develop much heat. If the surface gets burnished, H. removes the polish by rubbing, and thus restores the felt-like surface, to which the next layer readily adheres. Just before the completion of the filling, Herbert discovered that one of the cusps was not built high enough. As quick as a wink the polish was removed, and a small piece built on.

In same journal Dr. Brophy recommends the more general use of Robinson's metal, especially in children's teeth, both deciduous and permanent, previous to the twelfth year of age, also at cervical margin of gold filling. The pluggers used should be deeply serrated, and the filling malleted. Use in large pellets.

Dr. W. T. Morrill advises closer attention to the "Code of Ethics," and condemns resort to conspicuous advertising. He should also censure older and seemingly respected practitioners who put on gold crowns where porcelain should be used, and who extract teeth that should be filled, fearing failure and acting on the principle that "dead men tell no tales;" some of whom also claim to use all gold, but resort to oxy-phosphates, when other plastics would be better.

THE ECLECTIC MEDICAL JOURNAL, of Cincinnati—Medical Bookkeeping—Medical and professional men generally are very careless in their methods of business, especially being poor collectors. Bills should be presented at least once a month, and collected if possible. The majority of medical (and the dental as well) fail to present and enforce the collection of a bill. If they do not, they are "clever fellows"—but that does not educate orphans.

THE BRITISH JOURNAL OF DENTAL SCIENCE—Mr. Newland Pedly, M. D., R. C. S. and L. D. S., Eng.—On "Diseases of the Pulp, deals with the practical. He does not believe in "vent-holes." Gives drastic purgatives for active inflammation. If the tooth has frequently ached, or the pulp is exposed, he makes it a rule to destroy the pulp. Dr. Wm. Dunn, Jr., recommends the staining of artificial teeth to make them more correctly match the natural teeth that remain.

NEW ENGLAND JOURNAL OF DENTISTRY.—Dr, J. T. Codman: "The Early History of the Massachusetts Dental Society." It is only a repetition of the early formation and life history of all present societies. Lack of harmony makes them of less value to the profession than they would be. A friendly feeling among dentists makes the public respect the individual members of the profession. A want of union—looks like a lack of good faith—still, with all the draw-backs, any body of men, however inharmonious, is better than none; something good must come from the friction of ideas. One new idea to each member is sufficient compensation for the meeting. It stimulates study—which creates "brains, conscience and judgment."

Editorial on "Vent-Holes." It lays down a practice which is hard to be abused. All roots can be perfectly filled, although time and the proper material is necessary to do it. The popular root filling is chlora-purcha.

DENTAL COSMOS.—Dr. E. T. Darby devitalizes temporary teeth with carbolic acid, and cantharides—takes out the pulp—fills the crown of the tooth—leaving the pulp cavity empty—drilling a "vent-hole"—under the margin of the gums. A child should not sit longer than fifteen minutes to half an hour. The free cutting of the distul surface of second temporary molars is strongly recommended. The removal of temporary canines to make ,room for the permanent laterals is deprecated. "The practice of filling young teeth so generally with gold cannot be too strongly condemned.'[1] "Were the plastic materials more generally used prior to the fifteenth year, better results would be obtained."

INDEPENDENT PRACTITIONER—Dr. A. A. Blount, "The introduction and condensing of gold is a simple and easy operation. Any dentist of ordinary ability can make a good filling in a properly prepared cavity. No dentist, however skillful, can make a good filling in an improperly prepared cavity.

MISCELLANY.

STATISTICS SHOWING WHICH TEETH SHOULD BE EXTRACTED IN CROWDED DENTURES WHERE EXPANSION IS NOT PRACTICABLE.

BY PERCY MAY, M. R. C. S. ENG., L. D. S. EDIN.

The extreme importance of the question how crowded dentures should be treated has given rise to much discussion upon the subject, and has occasioned great diversity in the methods adopted in the treatment of these cases.

It would be beyond the scope of this paper to enter into the consideration of these methods, so that it must suffice to say that most practical men, while differing materially in their after treatment, yet agree that the extraction of one or more teeth is, in most cases obligatory, unless expansion of the arch by mechanical means would suffice without removal of any.

Some dentists remove one of the bicuspids in preference to the first molar, and it is in this paper my object to show that the rule is based upon wrong or imperfect data, as I trust the sequel will prove. Crowded dentures are commoner now-a-days than was the case formerly, and by removal of one of the bicuspids the irregularity may be rectified by mechanical means for a time, until the eruption of tee third molars, when the teeth resume more or less their old position, and so cause a secondary deformity, and it is with a view to avoid the occurence of these lamentable cases that I endeavored to ascertain whether any initial choice of teeth to be extracted may not achieve the object in view. It may be indicated that the table appended is complied wholly and solely from cases of persons from hospitals, dyspensaries, etc., this being important since it is among this class that but few teeth are removed to correct deformities, the patients, as a rule, valuing their teeth more than their appearance. Hence I say that nearly all these teeth were removed for actual disease.

The tables are composed without regard to age, and so supply a somewhat wider average than those recorded by Tomes, while they comprise between seven and eight thousand cases, a number sufficiently large to present an average which cannot be far from the truth. It will be seen on analysing these tables that out of 7,277 teeth, 2,823 first permanent molars have been extracted or prepared, as against 757 first bicuspids, upper and lower, and 944 second bicuspids.

This seems to show most conclusively, how infinately more important it is to remove the first than either of the latter. Of course in this statement, we are speaking under the assumption that all the teeth are sound. It now appears that what I hinted at above, viz., the avoidance of secondary deformity, is really best attained by following nature's lead, and removing the teeth which decay first, and thus leave room for the eruption of the wisdom teeth, thereby preventing overcrowding of the mouth again, by the 'vis a tergo," of these teeth.

It has frequently occurred that I have been obliged to remove one on either side of the mouth, of the first or second molars, although but slightly decayed, in order to relieve the painful symptoms arising from the over crowded denture, resulting from the eruption of the wisdom teeth. Clearly, in these cases extraction of the bicuspids must have failed to afford relief, or to permanently benefit the deformity. These statistics have been based upon cases treated during the last three years, and being freed as far as possible from accidental cases, may, I think, form a just basis for bringing this subject before the profession.

On searching over the English and American literature upon this subject, for very many years past, the only statistics I have been able to discover, are the tables by Tomes and J. N. Manton, as appended.

TABLE I.—Showing per centage of individual teeth treated (1881-83). Total number of teeth treated, 7,277.

Centrals	93	1.28	15	.3
Laterals	190	2.62	57	.8
Canine	112	1.54	42	.6
First bicuspid	555	7.63	202	2.78
Second bicuspid	561	7.70	383	5.27
First molar	1,190	16.41	16.33	22.48
Second molar	490	6.74	949	13.05
Third molar	286	3.94	509	7.00

TABLD II. (from Tomes' "Dental Surgery").—Showing per centage of decay under fifteen years of age.

First molar	68¼

First bicuspid	7
Second bicuspid	8¾
Lateral incisor	3½

COMPARISON BETWEEN MANTON'S 1,500 AND 1'500 FROM TOMES'S "DENTAL SURGERY.

TABLE III. (from "Odontolog. Soc. Transact.")—Cases treated between Oct., 1856 and 1857.

Centrals	27	36
Laterals	48	58½
Canines	43	39
First bicuspids	173	136½
Second bicuspid	209	217
First molar	602	562
Second molar	269	318½
Third molar	129	132½
	1,580	1,500

—"*British Journal of Dental Science.*"

MYCOSIS IN MAN.

[Supposed to have originated in Alveolar Abscess.]

Dr. J. Israel has published in Virchow's 'Archiv,' a recent observation on this affection. The patient, a woman aged 39, had had, ten months previously, a fall striking her chest against a bedpost. Three months later, she had pains in her limbs and daily repeated attacks of fever, and entered the hospital in a state of great prostration. Her appearance was suggestive of general septic infection. The whole body was covered with marks and scars of old abscesses as well as with fresh ones; there was a particularly large one on the left side of the thorax opening into a fistula, through which large quantities of fœtid pus were voided. The pus was of a green color and covered with small yellow corpuscles of the size of a pin's head or larger, which could be easily taken out with the point of a needle. When examined under the microscope, these corpuscles were found to consist in the centre of a thick mass of fungi, from which long thread-like appendices issued, branching off in every direction. The space between the latter was filled up with pus-corpuscles which had undergone fatty degeneration. There were three different classes of fungi: delicate thread of mycelium, micrococci, and a third form, pear-shaped and brilliant. The same constituents were found in the other abscesses. The woman died three weeks after entering the hospital. The necropsy showed that the large abscess in the thorax communicated with a large cavity filled with pus in the left lung. The liver, spleen, intestines, and kidneys, were covered with purulent foci varying in size from a lentil to an apple, and containing the same species of fungi. In the kidneys, the convoluted tubes were found in several places to contain embola formed of fungi, though there was as yet no suppuration in their vicinity. There could be no doubt as to the abscesses having been caused directly by the parasites, although it was impossible in this case to find the primary source of infection. The author, however, has offered the following hypothesis. He had noticed before that, in cases of caries of the teeth which had given rise to absceses in the gums, the pus of the abscesses contained fungi which bore a close resemblance to those which he discovered in this case of pyæmia or septicæmia ; this led him to suppose that the patient in question had a carious tooth, whence the fungi might have been aspirated into the lungs, and by some chance into a pneumonic focus which had been caused by the fall, and ultimately have been carried through the system through the medium of the circulation.—*Brit. Med. Jour.*

THE APOSTATE'S CREED.

The following very clever hit at the scientific unbelief of the day, written by Mr. A. Bierbower, appears in the New York *Independent :*

"I believe in a chaotic nebula, self-existent, evolver of heaven and earth, and in the differentiation of the original homogeneous mass, its first begotten product, which was self-formed into separate worlds, divided into land and water, self-organized into plants and animals, reproduced into like species, further develped into higher orders, and ultimately refined, rationalized, and perfected in man. He descended from the monkey, ascended to the philosopher, and sitteth down to the rights and customs of civilization under the laws of a developing sociology. From thence he shall come again, by the disintegration of the heterogenized cosmos back to the original homogeneousness of chaos.

"I believe in the wholly impersonal absolute, the wholly uncatholic church, the disunion of the saints, the survival of the fittest, the persistence of force, the dispersion of the body, and in death everlasting."

THE OBJECT OF EXERCISE.

If a strong active man, in perfect health, were to lie down in idleness during a few months, his strength and vigor would depart from him, his muscles would become soft and weak, and he would be in fact, an invalid.

Were he then to rise up and take moderate exercise at first, gradually increasing the amount until he had resumed his accustomed activities, his muscles would resume their former firmness and strength. Men have control over their health, and if they fail to do their part in the world it is usually their own fault. If they strive to do too much and thus impair health and shorten life it is their own fault. Those are happiest and live the longest who are well nourished and whose regular business demands about the same amount of bodily activity every day, as would be essential to health under any circumstances.

The object of exercise is to stimulate the vital organs to healthful activity. The breathing becomes more rapid under exercise, the blood is more rapidly oxygenized,the circulation is quickened,and the refuse matters are eliminated more promptly from the system ; the digestive organs do their work more promptly and more thoroughly, and a demand is soon made for new material ; the individual is hungry and takes food with increased relish. Thus the machinery of life runs on smoothly and naturally under the stimulus of fresh air and exercise, the strength is renewed and disease banished.

The best of all methods of exercise is horseback riding, and this is the reason : The horse does most of the work, and the rider receives most of the benefit, because he does not exhaust his own strength but that of the horse in taking the exercise. The rider is passive to a great extent, particularly if he has a horse with an easy gait. He is shaken up without becoming fatigued, and he really gets more air in the lungs than if he were walking. Another most important point is the excitement and pleasure of riding; it is often a new sensation, while walking is commonplace and soon becomes tiresome, and then its benefits diminish. Still walking is next to horseback riding, and is a method of locomotion that renders us quite independent.—*Hall's Jour. of Health.*

A NEW LIQUID GLUE.

A solution of 1 part of sugar in 3 parts of water, when applied to paper, gives to the latter neither lustre nor binding properties; but if to the solution be added ¼ part of slaked lime (calcium hydrate), and the mixture, after heating to 145°—165° F., be macerated for a few days, with frequent agitation, most of the lime will dissolve, and the syrupy solution possesses both adhesive and glazing properties. If to 12 to 15 parts of this solution be further added 3 parts of lime, in small fragments, the latter will rapidly dissolve on warming and, on cooling, will remain liquid, without losing its adhesiveness. According to the quantity of saccharate of lime present, the consistence of the liquid glue may be used for a variety of purposes, but must not be employed in presence of coloring matters, which are decomposed by lime, such as Prussian blue, zinc-green, etc.—*Polytech. Notizblatt.*

CONGENITAL DEFORMITY.

While treating a boy sixteen years old for rheumatism, I incidentally noticed the absence of the last phalanges of the middle and ring fingers of both hands. The appearance was suggestive of amputation at the joint above the nail. I should not have suspected any other cause of deformity, only for the uniformity of stumps on the two hands. On inquiring the cause of the deformity the mother stated, that while pregnant with this son at about the fifth or sixth week, before she was aware of her pregnancy, she trimmed the nails of a pet canary bird, and in doing so cut into the "quick," causing pain to the bird, which gave evidence of the suffering in a plaintive cry. One can easily imagine the mingled emotion of pity, regret and sympathy that she experienced in this incident. How profound this impression was upon the emotional system, or what effect, if any, it had in producing the deformed hands, are perplexing questions. Have we here the relation of cause to effect, or a coincidence of events not thus related ?

The lady has given birth to seven children, none of whom with this exception were deformed, though she has lost three by death, sometime during childhood, nothing in the family history would indicate heredity as a cause of this malformation.

Arrest or perverted nutrition of the child *in utero* from whatever cause results in deformity. Whether many of the nevi and deformities, in their real or imaginary likeness to the supposed exciting causes acting upon the mother's mind during gestation, are the results of such influences or mere coincidences,offers room for speculation. While the curiously concerned are willing to attribute every case of nævus and deformity to some incident during gestation, it is believed that there are not a few cases reported, which are the results of mal-nutrition dependent upon other causes than emotional impressions from extraneous circumstances. That physio-psychological disturbances of the pregnant, especially in the early part of gestation, does affect the fœtus, in some instances ; to the point of producing malformation and the like, is unquestioned in the light of facts which afford the most reasonable explanation.

—COLUMBUS *in U. S. Med. Investigator.*

EFFECT OF TOBACCO ON BOYS.—Dr. Edward C. Otis says : that the evil effects of tobacco upon boys which can be said to have been fairly proved by observation, are :

1. An interference with and impairment of the general development, mentally and physically. Probably it does this by retarding progressive cell change and impairing nutrition. In an adult this developement has been attained; consequently, he can smoke with impunity so far as this effect is concerned, when the boy only does it with injury.

2. The tobacco heart. This likewise happens to the adult; but is, I should think, more likely to happen to the youth, and with graver result, because his is such an unstable age, physically. For this same reason the other injurious effects are more liable to be infensified in the youth.

3. Defective muscular co-ordination. I have but little proof to show that this condition is more than temporary, continuing only while the tobacco is used.

4. It reduces the intellectual power of the boy. It does this either by opposing mental application and effort, or else by producing deterioration of the intellect—probably both to a greater or less extent.

5. It impairs the memory. What proof I have adduced seems to show that this is a permanent injury.

6. It may cause defective vision and also irritation, more or less chronic, to the external parts of the eye.

7. It may unduly excite the sexual system and lead on to excesses. I have no positive proof of this, but my observation among boys rather points to it.

8. Irritation of the mucous membranes of the mouth and throat, more especially in cases of cigarette smoking.

9. It may impair digestion and produce other derangements, such as habitual uneasiness, hypochondriasis, etc.—*Bost. Med. Surg. Jour.* June, 13.

THE STATE OF CARBONIC ACID IN THE BLOOD.—At the Academie des Sciences, M. Paul Bert gave an account of his investigations into this subject. Following are his conclusions:—

1. The exit of carbonic acid during the respiratory act necessitates a dissociation of the super-carbonated salts of the blood.

2. These salts are not saturated with carbonic acid either in arterial or venous blood, or in the tissues.

3. The vitality of the anatomical elements can only be maintained in the presence of carbonic acid in a state of combination.

When the alkalies are saturated, and when this gas appears in excess. in a state of simple solution, it rapidly produces death.—*La France Médicale.*

THE PRESERVATIVE FLUID of the German government is made up of alum, 100 parts ; salt, 25 ; nitre, 12 ; potass. carb., 60 ; arsenic, 10, and water, 1,000 parts. Mix, cool and filter. Then add to ten litres of this fluid four litres of glycerine and one of methylic alcohol. Two to five litres of this liquid will preserve a cadaver

Bodies saturated therein will, it is claimed, keep for years their form, color and flexibility. The method is partly by injection and partly by immersion. The smaller objects of natural history collections, as snakes, birds, fruits, butterflies, algæ, etc., are preserved as perfectly as larger bodies. Dr. Wickersheimer was the inventor of the process, the patent for which has been purchased by the government, and then by it the composition has been made public.

A PECULIAR DEVICE to terminate the chloroform narcosis is mentioned by Schirmer in the February number of the *Centralblatt f. Augenheilkunde.* He claims to have used it in his clinic for many years, and often succeeded in producing inspiratory movements when other means failed. He also employed it to induce rapid recovery, for instance, in strabismus operations, in order to test the result. The method consists in irritating the nasal mucous membrane. It has long been known, at least to physiologists, that the fifth nerve retains its sensibility longer than any part in narcosis, and that reflexes may be induced through this nerve when other irritations fail. Schirmer uses simply a rolled piece of paper, which he turns in the nose. In dangerous cases he dips the paper into ammonia.—*Medical Press and Circular.*

THE INFLUENCE OF TEMPER ON HEALTH.—Our English contemporary, *Capital and Labor*, which is generally correct in its assertions, thinks that, while excessive labor, exposure to wet and cold, deprivation of sufficient quantities of necessary and wholesome food, habitual bad lodging, sloth, and intemperance, are all deadly enemies to human life, none of them are so bad as violent and ungoverned passions. Men and women have survived all the former, says the writer, and at last reached an extreme old age; but it may be safely doubted whether a single instance can be found of a man of violent and irascible temper, habitually subject to storms of ungovernable passion, who has arrived at a very advanced period of life. It is, therefore, a matter of the highest importance to every one desirous of preserving "a sound mind in a sound body," to have a special care, amid all the vicissitudes and trials of life, to maintain a quiet possession of his own spirit.

BIBLIOGRAPHIC.

NOTES ON DENTAL PRACTICE.—By Henry C. Quinby, Licentiate in Dental Surgery of the Royal College of Surgeons in Ireland, and member of the Odontological Societies of New York and London. With illustrations. Philadelphia: The Mute Dental Manufacturing Co., 1884. Price, Cloth, $2.25.

This is a work of two hundred pages, and eight chapters, devoted to the consideration of the following subjects: "The Temporary Teeth," "The Permanent Teeth," "Extraction as a Means of Preventing Decay," "Irregularities," "Treatment of Adult Teeth," "Amalgam" "Piroting" and "Gutta-Percha for Impressions."

This work is not intended as a complete text-book, but contains a "clear and succinct exposition of his methods in every day practice." The style is lucid, clear and exact, and well displays the value of the daily experience of a skillful practitioner. The author gives much excellent advice; for instance, he says, "I am very decidedly of opinion that the examinations (of the teeth) should at least be commenced at home, in order that no idea of fear should be associated with the performance of this duty. Children will learn much more readily to take the needful care of the teeth, when the parents show real interest in teaching them to do so." "Extraction is rarely necessary as a mere cure for pain, and should never be resorted to when this alone is the object."

His recommendation that "if it is decided to make use of an anesthetic, the assistance of a surgeon should be considered indispensable," will not meet with a very general response from the dentists of this country. An educated dental surgeon should be fully qualified to administer anesthestics successfully, and as safely as the nature of such exhibitions will admit. Artificial anesthesia is always unsafe,for it is a state on the borders of death. In producing this state, no precaution can be superfluous, no care too minute and no watchfulness too great. But the dental practitioner should be quite as competent to exercise these important duties as the physician or surgeon, usually more so, for the reason of his greater experience. Dr. Q., favors the use of plastics up to the sixteenth year of age. With that practice many American practitioners will agree.

The book is a good, and useful volume, which every dentist could read with pleasure and profit.

The illustrations are excellent and the work of the publisher has been unusually well done.

LETTERS FROM A MOTHER TO A MOTHER on the Formation, Growth and Care of the the Teeth, by the wife of a dentist, Mrs. M. W. J. Atlanta, Ga. Judson and Dunlop, 1883.

The letters composing this volume appeared consecutively in the *Southern Dental Journal*, and many of them have been copied into other dental periodicals. With a single exception, dental journals have spoken highly of these letters. It is not necessary that an extended review of these well-known and most excellent letters, should be made at this time. It is sufficient to say, that we regard them as them as the very best that have yet been written upon the subjects upon which they treat. A second edition is about to be issued and we trust the work will be sold at a price that will enable every dentist to keep them constantly on his table either for free distribution or for sale at a low price. Such a course will encourage their sale among the laity, and promote a better knowledge of the subjects to which these letters relate.

DENTAL MEDICINE. — A Manual of Dental Materia Medica and Therapeutics, for practitioners and students, by Ferdinand J. S. Gorgas, A. M., M. D., D. D. S., Philadelphia. P. Blakeston, Son & Co., 1884.

This is the first American work on Dental Materia and Therapeutics that has appeared, and for that reason, if for no other, has attracted universal attention. There is probably no subject connected with dentistry upon which practitioners would differ so widely as that of therapeutics. Hence, a work on this subject could not be expected to be universally, nor, perhaps, generally acceptable. Opinions concerning this work, as expressed in reviews of it, differ so widely, that we do not, without a more thorough examination of the book than we have yet given it, feel prepared to speak decidedly on its merits. That it contains much that is valuable, a cursory examination shows, and that it is a useful book we think no one can well question. For a more extended review of its contents, we must ask our readers to wait until time has afforded us an opportunity to read the whole volume with care.

PAMPHLETS.

We are indebted to the secretaries of the following named societies for copies of the annual transactions of their respective societies, for which they will please accept our sincere thanks:

Transactions of the American Dental Association at the Twenty-third Annual Session held at Niagara Falls, Aug. 1883.

Transactions of the Illinois State Dental Society, Nineteeth Annual Meeting, held at Decatur, Ills., May, 1883.

Transactions of the Dental Society of the State of New York, Fourteenth and Fifteenth Annual Meetings, 1882-1883.

Iodoform in Dental Surgery, by C. F. W. Bodecker, D. D. S., M. D. S., New York. Reprinted from the Independent Practitioner, March and April, 1884.

Caulk's Dental Annual. Second Edition, by L. D. Caulk, Camden, Delaware, 1883-84.

Listerine, an antiseptic for internal and external use, especially adapted to dental practice. Lambert & Co., St. Louis, 1884.

NOTES AND QUERIES.

NOTE.—Items in this department will be numbered consecutively. Answers to questions, whether one or more, will bear same numbers as the questions to which they relate.

ANSWERS.

1. I think the operation of replanting is a permanent success. I have performed it twenty-three (23) times in the last five years with only two failures. I performed the operation three years ago for an old lady 82 years of age. The tooth was still good the last time I saw her, six months ago.

W. A. MOORE,

BENICIA, Solano county, Cal.

4. Our observation of gutta-percha root filling is similar to that of J. P., to this extent: A portion of those that have been removed have not been odorless, and we have noticed that the fillings that have been in for the longest time, have carried the most odor. Shall we not have the observations of others on this important point? SIGMA.

5. The roots of deciduous teeth are absorbed after devitalization and removal of the pulp, provided the pendental membrane retains its vitality. When this is destroyed and the circulation through the cementum is cut off, the roots are not absorbed. So I think.

M. W. J.

THE

Archives of Dentistry.

A MONTHLY RECORD OF DENTAL SCIENCE AND ART.

Vol. I., No. 5.] MAY, 1884. [NEW SERIES.

ORIGINAL ARTICLES.

> "Of all the arts in which the wise excel,
> Nature's chief masterpiece is writing well."

NOTES—CRITICAL AND MISCELLANEOUS.

BY PROF. J. RICHARDSON, TERRE HAUTE, IND.

We are in receipt of a printed circular addressed to the various State Dental Associations soliciting co-operation in the formation of another National organization. As there are already three in existence, embracing in their membership the best elements of the profession, it is difficult to divine what immediate or pressing necessity exists for a further multiplication of them. The circular does not shed any light upon this point beyond a confused and gratuitous assertion of the incompetency of existing national bodies to fullfil adequately their high missions as representatives of the dignity and achievements of American Dentistry.

The pretext under which an additional organization is projected appears in the somewhat startling and oracular announcement that "The foremost men of our profession admit the fact that the name of American dentistry has not that world-wide recognition which its honor demands, and its history would warrant."

Just what measure of recognition is required by the gentlemen whose signatures are attached to the circular as satisfaction in full of the demands of its honor, (which by the way is an undefinable something that may be set down as expressing an uncertain quantity in the general make-up of professional character) or its history entitles it to, is not stated with any degree of explicitness in the circular. That both its honor and history are under a cloud, however, and that there is a manifest lack of supply in the matter of recognition, is stated with sufficient emphasis. This new revelation of the eclipse of the name of American dentistry among the nations of the earth will sadly dissipate the cherished faith inspired in the hearts of the credulous masses of the profession who have been betrayed into a contrary opinion by heretofore supposed "foremost men" in endless panegyrics upon the leading and commanding position of American dentistry everywhere. In the demoralized and chaotic state of mind, however, in which this unlooked-for and astounding revelation leaves us, there is infinite and compensating comfort in the reflection that an all-sufficient scheme has been happily devised by which the suffering and imperilled honor of American dentistry may be vindicated, and the historical grandeur of its achievements fittingly recognized at home and abroad. This ingeniously contrived deliverance from the evil with which our profession in this otherwise favored country is at present handicapped is to be brought about by supplementing existing National organizations with "one great representative body of the profession to speak forth with authority its aims, duties and attainments." This is the coming Association.

Now if it can be made to appear upon sufficient evidence that, as is plainly charged by implication in this circular, existing organizations have failed to "place it (American dentistry) upon a basis commensurate with its dignity," then by all means let them be antagonized by one that will give assurance of improvement. But until this is done, and a "bill of particulars" filed setting forth somewhat specifically and in detail the respects in which the bodies referred to, either in the professional character and attainments of their membership, or in the work accomplished by them, do not creditably represent the best phases of American dentistry, theoretical and practical, State associations, we apprehend, will be slow to indorse, by co-operation, the broadly implied aspersions affecting injuriously the character and standing of existing organizations. Moreover, a failure to make out a case against them will fix upon the minds of many the impression, whether justly or not, that the present scheme is instigated by underlying motives that do not run altogether parallel with a consuming desire simply to vindicate or enhance the honor and dignity of American dentistry.

The American Dental Association, which is perhaps most nearly representative of the highest culture in the profession of this country, was organized a quarter of a century ago by the ablest exponents of American dentistry at that day; its roll of membership through all the intervening years embraces a large majority of the most accomplished practitioners throughout the limits of the Union; and among those at present in hearty sympathy and co-operation with it are the names of men conspicuous for their scholarly and professional attainments wherever the science and art of dentistry are cultivated. The writer will not be accused of any selfish bias in favor of a body with which he has not been actively associated for a number of years, though assisting in its organization, and whose policy in some respects he has taken occasion to criticise through the journals, but what is said of it here it is proper should be said in answer to the implied charge that this and other similar bodies are a discredit to American dentistry by reason of their failure to "command that world-wide recognition which its honor demands," or to "place it upon a basis commensurate with its dignity." If these are failures in the respects spoken of, the outlook is indeed gloomy, for it would be impossible to find any body of men in the profession outside of, or apart from, these several organizations who would give reasonable promise of any improvement either in the "aims, duties or attainments" which it is thought by the signers of the circular to be the special mission of the coming association to "speak forth with authority." For the benefit of all who may indulge such visionary expectations, we would commend placing above the entrance-way to the new association Dante's familiar inscription, "All hope abandon, ye who enter here."

Another feature of this project is thus stated: "As important adjuncts to this Association, we believe it would be found expedient to establish an extensive library, to contain dental works and publications, standard and periodical, foreign and native; and the founding of a national museum, to illustrate the past, present and future of dentistry.

"The wonderful benefit to the profession and humanity in general to be derived from these is certainly manifest to every intelligent dentist."

At the risk of being placed in the category of those who are lacking in intelligence, we must question the overshadowing importance of a national library and museum that would be practically inaccessible to the masses of the profession. It would be of vastly more importance to build up libraries and museums in connection with State associations, where the rank and file in annual attendance upon these gatherings could "view the remains," and consult authorities. Yearly appropriations by State Societies out of surplus funds for such purposes would be a power as an educational measure, while the people's money in the public treasury might be left where it is to be disbursed in legitimate ways.

"We are sure" says the circular, "that room can be obtained in the Smithsonian Institute for the museum, and in the library of the Surgeon General's office for the library. We are equally sure that Congress will grant an appropriation for both purposes, as is done for the medical profession."

This child-like faith and confidence in the paternal care and generosity of the government is very beautiful and touching, but it is unfortunately misplaced. The appointment by the general government of army and navy medical staffs imposes the same obligation upon the former to maintain their efficiency as that assumed in reference to any other branch of the public service. Whenever dentistry secures an equal footing with medicine in the employment of the government, it may demand and would secure appropriations for general and specific purposes, but not before.

IS THE ORGANIZATION OF THE DENTAL PROFESSION COMPLETE?

Editor Archives of Dentistry:—The enclosed letter, as you will see from the date and its contents, was written at the time when the three large societies of a more or less national character appointed committees to confer and report on some plan of uniting all the organizations so represented, in *one*, if deemed advisable. You know the result.

As there is now a movement in progress to establish another national organization on substantially the same basis, it seems an opportune time to present for the consideration of the dental profession the views contained in the letter alluded to.

As that letter was never sent to Dr. Harlan, and was never published, you are at liberty to publish it.

Yours truly, L. C. INGERSOLL.

Keokuk, May 24, 1884.

Dr. A. W. Harlan, Chairman of Committee of A. D. A.

MY DEAR SIR: Perhaps it is too late to make any suggestions which would imply a radical change or additional work in the present movement to establish a new organization announced as a "National Dental Association." Not having been very familiar with the incipient steps of this movement, or with the ultimate purposes to be accomplished, I am left to conclusions based almost wholly on the "call" published in the July number of the *Cosmos* for a convention in the city of New York to effect the organization of such an association. I have long felt that the organization of the Dental Profession of America is not complete—that existing organizations have not stamped it with the character to which the profession have aspired. If the present movement is an effort to unite the three existing associations, which have more or less the character of national societies, into *one*, organized on substantially the same basis, the object is well worthy of the effort. The profession, divided and localized by separate State organizations, needs a union of its parts into a recognized whole. If either one of the present large organizations should *assume* to be the whole—the central power of professional influence in this country—we may well ask What is the need of the other two parts? If a machine can best be supported and worked on a pivotal center, what is the use of a tripod? A multiplication of associations on substantially the same basis is to be deprecated. The profession needs *unifying*. If, therefore, it is contemplated, in the event of establishing the new organization, that the three organizations uniting in the movement will be abandoned, the result will mark an epoch of great progress in the organization of the dental profession in this country.

When two years ago the American Dental Association reorganized in "sections" some were enthusiastic with the idea that now the dental profession had taken on a character which would raise it high in the rank of the professions. It is not the style of the carriage that a man rides in that makes him truly great. The man must be great in his own personality.

All organizations thus far of a national character have been projected with the idea of uniting the *profession* throughout the country in the promotion of their common interests, differing in no material respects from the different State organizations.

All organizations thus far, whether State or national, have been *representative of the dental profession* in the State and in the nation. It is altogether possible that a profession considered from the standpoint of science may not be well represented by those counted as members of that profession; as dental science is one thing, and the dental profession another and a different thing.

While, then, the profession needs a large active national organization which shall be truly representative of the *dental profession* in America, has not dental science become so far advanced and a dental practice so well established as the outgrowth of learning and study as to demand an organization of American dentists which shall be *representative of dental science* in America? An organization which at different periods of its existence shall represent not the status of the average dental profession in America, but the status of American dentistry? An organization that shall mark from decade to decade the highest point gained in dental science and in dental practice, and not the average status of the dental profession? Societies thus far organized give us only the latter. Unrestricted membership can do no more. Neither can the restriction of membership as established within a few years by the American Dental Association. We need to have a society formed on a different basis from any yet organized, a society which shall embrace only the leading men in the profession. By this, I do not mean the leading men in New York, Pennsylvania, Massachusetts, or in our dental colleges, but the leading men in all the States of America where have been established centers of controlling influence. I would have the organization made up of men only who had distinguished themselves in some department of dentistry, literature, science, or practice; men whose researches in science, or whose practical skill, or whose contributions to dental literature had attracted so largely the attention of the profession as to give them a controlling influence over large numbers of the profession.

The opinions of such a body would be respected; their counsel would be accepted as wise, and their teaching and methods of practice become the standard of American practice, while radical digressions from it would most naturally and by universal consent be esteemed mal-practice. At present our standards of practice are so varying that to make out a case of mal-practice, however erroneous it might be, would be quite impossible.

The plan of such an organization I have not fully matured in my own mind. It should have its origin by mutual consent in the higher organizations of the country. After the formation of a constitution a unanimous meeting might be held of the three organizations or representatives from each who should elect from various points of the country, say, thirty representative men as a nucleus of the organization. These should constitute the society and have sole power to act in election of other members. None should be elected whose *public acts* and demonstrations, did not sufficiently and alone, without private recommendation, declare their fitness for this high position.

I would not have eligibility restricted by college diplomas. It should be made a position of honor above diplomas, obtainable either with or without a diploma.

The advantages of such an organization would be these:

1. It would elevate the dental profession to that platform on which all the older professions have been judged and assigned their rank by the only test which educated society will allow—learning.

2. By some such method only can the dental profession hope to be esteemed one of the "learned professions."

3. It would create a position of honor greatly stimulating to the studious and progressive members of the profession throughout the country—and, therefore,

4. It would afford the highest stimulus to scientific research, profound culture and progress in dental science, art and practice that will ever be the privilege of the dental profession to offer.

5. Whatever differences in matters of theory or practice the dental colleges may present, the deliverances of this organization would be looked for to settle. Those who from year to year join the ranks of the profession would test the teaching of preceptors by the teachings of this body.

The book of "Transactions" of this body should not be made up as are the "Transactions" of other bodies, by the publication of *every paper* read before it. No paper should go into it without the sanction of two-thirds, or a majority, of its members present. This would make the book to be sought for by the great body of the profession as a text book of our professional science.

This you will understand is no scheme to supersede the one now in progress, but is *additional*, and one that may fitly be inaugurated with it.

The present system of representation by delegates from State societies has too many bad features to make the American Dental Association a fair representation of the dental profession. A man even below the average in his own State organization is often elected a delegate simply because of his willingness to spend the time and money to go—having in view only the supposed honor conferred upon him by being a delegate to the American Society—or because having business that necessarily calls him into the neighborhood of the meeting he can "take in" the society and all its honors cheaply.

You would pardon this hasty writing should you see me a convalescent in *deshabille*, in my chair, writing on my knee.

Most respectfully yours,

L. C. INGERSOLL.

Keokuk, Iowa, July 28, 1880.

HOW TO SECURE GOOD DENTAL ORGANS AND PREVENT THEIR DECAY.

BY H. E. DENNETT, D. D. S., BOSTON, MASS.

In discharge of their duties, dentists and physicians are daily asked by their patients, "What must I do to prevent my teeth from decaying?" The answer should be, "Correct your diet." That is, eat such food, and only such as contains all its natural elements. If we eat grain; we should eat it with all its elements as furnished by Nature. If we eat meat, we must also eat bones, or our system will suffer from a violation of one of Nature's unerring laws. It is considered that dental decay is the dissolving away of the lime salts by vitiated secretions. This is not due so much to a want of cleanliness of the mouth as is commonly supposed; for it is not true that "a clean tooth never decays." One may devote twelve hours out of the twenty-four to the ablution of the mouth and fail to prevent the teeth from decaying so long as Nature's dietic laws are violated. Acid will dissolve lime salts whenever the two meet. Acid saliva may be expected to follow an excessive use of acids, or of those elements that produce acids, or from a deficiency of the opposite elements. Dental development in man is discernible as early as the seventh week of intra-uterine life; hence the importance of a strictly correct diet from the start, if mothers wish to give birth to children who may have perfectly formed teeth, and perfect health includes perfect teeth, for they are little indicators denoting by their condition that of the whole system, just as a thermometer indicates thermal changes. A mother who passes through the periods of gestation and lactation without a sufficient amount of bone and tooth element in her food will suffer from loss of teeth, neuralgia, rheumatism and other diseases which are the result of a system impoverished and drained to its utmost. The lime from her teeth will be dissolved, taken into the circulation and appropriated by the offspring. Excepting civilized man, all flesh-eating animals take as much of the bone with the flesh they consume as they can break with their teeth sufficiently fine to swallow, and all have good dental organs. Place before a tribe of Indians everything the earth produces in the shape of food, and they will eat only animal food so long as that lasts, but put them upon a reservation and feed them as civilized people feed themselves, and they, too, soon suffer from decay of the teeth. Take from any carnivorous animals their supply of bone which nature has furnished with the meat, and dental decay will be the inevitable result. Several years ago the lions in the Zoological Garden of London were fed upon the thighs of horses. The bones being large and hard, they were unable to break and eat them. As a result their young were born with cleft palates and died shortly after birth. Subsequently they were fed upon deer and other small-boned animals, and their young were born with perfectly formed palates and lived. Veterinary surgeons have long known that certain diseases of their dumb patients can only be successfully treated by feeding them bone meal. A dam too aristocratic to gnaw bones, gave birth to successive litters of rickety pups, but after being fed with food which contained a liberal percentage of bone meal, she produced perfectly healthy ones, and by the same sire. Arguments in favor of eating bone to prevent decay of the teeth, as well as to cure a long catalogue of bone and kidney diseases, might be continued indefinitely, but as "a word to the wise is sufficient," it seems only necessary to add that a long and continued experiment has been made upon a family with the most satisfactory results. The bones used were selected from perfectly healthy animals, carefully cured, finely granulated and incorporated into soups, gravies, bread, etc., in the proportion of from one to three spoonfuls to each pint of soup, gravy or flour. The relative proportion of nutritive elements in one hundred parts of different kinds of animal food have been found as follows: Beef, 26; mutton, 29; chicken, 27; pork, 24; blood, 21; codfish, 21: milk; 7; bone, 21.

NOTE.—Our observation is that an acid condition of the saliva does not follow an excess of acid food. The fruit acids, for instance, such as the malates, tartrates, lactates, citrates, etc., and, indeed, the salts of all the organic acids, are decomposed in the processes of digestion and assimilation, especially the latter, and reappear in the form of carbonates in the renal excretions.—[ED., C. W. S.

DENTAL SOCIETIES.

THE TWENTIETH ANNUAL MEETING OF THE ILLINOIS STATE DENTAL SOCIETY.

The Twentieth Annual Meeting of the Illinois State Dental Society assembled in the Senate Chamber at Springfield, Ill., Tuesday, May 13th, 1884.

The meeting was called to order by the President, Dr. Edmund Noyes, of Chicago. Afterwards the roll was called by the Secretary, Dr. J. W. Wassall, of Chicago, showing an attendance of seventy-eight members, which was subsequently increased to ninety-eight.

Prayer was offered by the Rev. Dr. Post, of the Congregational Church.

Miscellaneous business came up at this juncture, and upon its completion, the reports of committees and officers were heard. The election of new members was followed by the President's address—Vice-President H. H. Townsend, of Pontiac, in the chair. The address was a comprehensive review of the past year, with a prediction of a brighter future.

After the appointment of committees the society adjourned until 2 o'clock P. M.

AFTERNOON SESSION.

After the reading of the minutes of the morning session, and the transaction of other routine business, Dr. A. W. Harlan, of Chicago, from the committee to ascertain and report what arrangement, if any, had been made for Dental representation at the proposed International Medical Congress at Copenhagen, on August 12-16th, next, reported that after considerable inquiry, personal and by correspondence, he had been unable to learn that the plan of the proposed gathering contemplated a Dental section; on the contrary, his assurances were in the negative. The report was agreed to.

A number of corresponding members from other States were present at this session, and several applicants for active membership, being favorably reported upon, the candidates were elected by ballot.

The regular order being then taken up, Dr. S. F. Duncan, of Wilmington read his paper upon "Exposed Dental Pulps and their Treatment."

The usual methods of capping and of devitalization were discussed in this paper. Aconite was recommended for both local and internal use, and the stick of wood in preference to the barbed broach for the removal of the pulp from root canals.

The oral discussion was opened by Dr. J. N. Crouse, of Chicago, who urged that to arrest the decay and prevent the destruction of the teeth, is the crowning work of operative dentistry.

He stated that a correct diagnosis of the actual condition of the pulp was of the first importance. If the pulp is exposed and living, the dentine at the point where the exposure will most likely be found is usually sensitive. If the tooth is reasonably sensitive at the line of union of dentine and enamel, a condition of the pulp favorable to capping is indicated. Always leaves softened dentine over the point of exposure and over the entire floor of the cavity and caps over that. After excavating with care, syringes the cavity forcibly, then dries it out and applies carbolic acid. This is allowed to remain several minutes. Is not particular to wipe out all the carbolic acid, sometimes leaves considerable. Children's teeth decay more rapidly than those of adults, and the pulps are relatively larger; consequently more caution is required in excavating. Have many times unexpectedly uncovered pulps in the sixth year molars Aching teeth are treated for the relief of pain, and afterwards at the same sitting successfully capped and filled. This was not his former practice, but is now, and finds it justified by experience. He commenced the practice of capping exposed pulps with some doubt; he might say skepticism. The older practice was to remove the pulp—at least a portion of it. But his later experience had fully demonstrated to his mind the utility of capping, and such was now his uniform practice, even in the case of children. Of course the condition of the pulp—whether abnormal or normal—was to be considered. If that was all right he proceeded to cap, and at once proceeded with the operation of filling. If the cap was carefully put on there was little danger of subsequent aching of the tooth.

"I cap with whatever material seems best adapted to the case, often use oxy-choride of zinc, and sometimes oxy-phosphate. Prefer the former for the reason that it flows more easily over the opening. It does not cause pain, or, but very little, when the pulp is previously treated with carbolic acid.

Others differ with me regarding the frequency of capping. If those who object say it is not a good practice, I say to them, you have not applied the caps with sufficient skill (laughter) or you would succeed as I have. For fourteen years I have had good success in capping, and I can show cases I have examined three years and more after the operation, and found the pulp still alive."

Dr Spalding.—[of St. Louis.] "What proportion, relatively, does your success bear to your failures?"

Dr. Crouse.—(resuming), I estimate my failures, sir, at not more than one-tenth—perhaps less. If I have carefully done the work, success is pretty sure. I have had cases where I really supposed the pulps would die, but I capped nevertheless, and afterwards found them doing well. A boy called in my office only two days ago, for whom I had capped pulps five years ago. I examined them and found them alive and in good condition."

If filled temporarily, cap must not be disturbed when permanently filled. State of general health not much considered. Has successfully capped pulps that have been exposed for years. Have capped many that I supposed would die, but they recovered.

Dr. Patrick.—[of Belleville.] "I would inquire if after thus treating it, you have removed the cap from the pulp, and with what result?"

Dr. Crouse.—"Yes, sir, I have often done it and found the pulp alive and doing well. All aches and pains were gone. I have had patients come into my office in great pain, and after capping, I rather expected them to come in next day, perhaps howling with pain; but if they came they did not complain at all. Why, sir, as skeptical a man as Dr. Dean, years after such capping, made an examination and found the pulp not destroyed."

Avoids wounding, but does not hesitate to cap a wounded pulp. Has tested many such cases and found pulp alive years after capping. It is a very delicate operation and unless skillfully done will not succeed.

Dr. Newkirk.—"How long, doctor, have you used carbolic acid; and have you used creasote? If so, with what result—comparatively?"

Dr. Crouse.—"I have not found creasote as reliable as carbolic acid. It generally does not produce so firm a coagulum. When it does, it may be that it was due to the impurity of the creasote, for much that was formerly used as creasote was, in fact, carbolic acid, or was largely mixed with it."

Dr. Patrick asks, if the coagulum is left, and if so, what becomes of it?

Dr. Crouse.—"The coagulum is not disturbed."

Dr. Black subsequently explains that the coagulum is absorbed in the same manner that extravasated blood is.

Dr Patrick, was invited to give his experience in treating exposed pulps. Well, he was sorry to say that in capping, his success was not especially good, particularly when the pulps had been long exposed. Many years ago he was taught to trust to nature and has followed the practice of removing the soft tissue and filling afterwards. He had been somewhat of an infidel in this matter, and was still skeptical. He had capped pulps with success, at times, but he took no risks.

Dr. Sudduth, [of New York] said there was little trouble in capping pulps in ordinary cases, where the patient's condition justified it.

Dr. Townsend.—observed that his experience in capping was not wholly like that of Dr. Crouse.

The debate here became very animated and general, amid which Dr. Crouse was asked:

"What do you mean by saying that you expected patients to come in raving with pain as the result of the operation? Is it that you expected pain would follow the capping, and were surprised that it did not?"

Dr. Crouse.—"Yes, I expected the patient might complain of pain. But I meant to be understood figuratively; not that I was surprised such results did not always follow. Oh, no!"

Dr. Patrick.—Ah! I thought the gentleman spoke of his general practice in preventing pain, not of an isolated case. (Laughter).

Dr. Crouse.—Dr. Patrick has misconstrued my words. If he will come to Chicago, I will show him the result of capping in frequent practice and he will return to Belleville not an infidel, I am sure.

Dr. Nelson would inquire of Dr. Crouse whether his subsequent examination of pulps established the utility of capping?

The president, Dr. Crouse, has already said so.

Dr. W. H. Eames.—[of St. Louis.] I came here from St. Louis in pursuit of information. You don't expect to learn much from me; but I would like to ask a few questions. I am much interested in this subject of capping pulps. We have here good operators who get up before us and explain their methods, but I'd like to know somewhat further. First, I would like to ask Dr. Crouse how he decides upon the condition of the pulp—that it is healthy enough to justify capping? What evidence has he of this health, or what evidence does it require to convince him that it is proper to cap? Dr. Crouse says, if I understand him right, that he tells by the sensitiveness of the part, and I ask him to tell at just what point to draw the line between the health of the pulp and its abnormal condition. I think that health has much to do with the justification and with the result of the operation. Another matter would influence me in deciding upon the operation—that is age. The tooth-pulp of an adult might be capped when that of a child ought not to be.

Dr. Spalding, being called upon, responded that more than twenty-five years ago, before the capping of pulps was practiced, he adopted the practice of devitalization and removal, and had not been sufficiently successful in capping pulps to induce him to change his general practice. Now a few words relative to devitalization. About thirty-four years ago I ordered a druggist to fill the usual prescription employed for this purpose, viz: Equal parts of weight of arsenious acid and of acetate morphia. Having in mind my knowledge of homoepathic pharmacy, I ordered the mass triturated half a day, for the purpose of being assured that the Ars. Ac. was minutely divided. I have used from the bottle containing this prescription ever since, and have distributed a part of its contents to others. Have met with none of the difficulties sometimes encountered in the use of arsenic, and I attribute my success to the finely divided condition of the active agent. Complaint is often made of difficulty and failure in destroying the vitality of the pulp near the extremity of the root canals. I do not hesitate to introduce this preparation into a root canal, and to convey it nearly or quite to the foramen at the apex. A mere dust on a dry broach is sufficient for this purpose. I have never observed any disagreeable consequences resulting from such practice.

Dr. Patrick.—"I'm still inquisitive. Will Dr. Spalding be kind enough to tell me which element in the preparation acts first, the arsenious acid or the morphia? I came heré, two or three hundred miles, foı information."

Dr Spalding would cheerfully explain. He used morphia for the simple reason that others had done so before him. Thought it probable that some other substance, say some neutral substance, would answer just as good a purpose as the morphia. It was the arsenious acid that did the work, and so far as he knew, the morphia only served to increase the bulk, and thus lessen the amount of Ars. Ac. applied.

Dr. G. V. Black.—[of Jacksonville], said that he was already on récord on this question, for he had expressed himself at former meetings. His earlier experiments in this pulp matter were not very successful. He would suggest that we differentiate, for cases vary in pathological condition. Thus Dr. Crouse says if the pulp is normally sensitive he decides to cap. I will only add that if I see an abnormal condition, I decide not to risk capping. I would hesitate more in a child's case than in that of an adult. The pulp is less and less important with age and more important with a child.

One could cap the pulp in the mouth of a child with much better results. I think experience shows that. Something has been said about the coagulum. I had rather not have that coagulum. I think if the parts are healthy the removal may be brought about by absorption. The removal of the blood clot there by absorption is not different from the removal of a clot in the tissues anywhere.

The doctor was here interrupted by the query: "If the pulp absorbs the coagulum, where is it?

Dr. Black.—I answer: In the tissue. The extravasation of blood is a coagulum; distributed in the tissue it is removed by physiological action.

As to the manner of capping, my practice has been to avoid irritation, hence I abandoned the use of chloride of zinc and also the use of carbolic acid in large enough quantities to irritate. A greater per cent of success is attainable, I am persuaded without forming a coagulum. By using about a 30 per cent solution of carbolic acid, then ox. phos. of zinc for cap. I use a little piece of paper and drop on this the preparation of ox-phos.; then carry it into the tooth and lay it there. The warmth distributes it evenly. I think that makes the nicest cap. Then I use wintergreen and oil of cinnamon.

Concluding, Dr. B. again emphasized the necessity for regarding the condition of the patient.

Dr. Sitherwood, of Bloomington, said that success in capping depended to a great extent upon good instruments and mechanical skill and dexterity in using them. He used listerine as an antiseptic in preference to carbolic acid. A leading physician of his acquaintance had used listerine very successfully in irritations of the mucous membrane, and thus he was led to use it and to commend it.

Dr. Newkirk, of Chicago.—The condition of the blood naturally affects the tooth, as other parts. What is the condition of the pulp? That is the question and is the principal consideration to govern in the operation. Then skill and judgment avail. But if the conditions are bad they will not avail and the pulp will die in any case. Put a little oil on the probe; it will go easier. With regard to instruments, I fear we use sharp points too much. I would have a curved-edge, perhaps I should say spoon-shaped. No pulp should be capped if hemorrhage exists, otherwise we have a phase of embolism. It is important to delay capping until hemorrhage ceases—then nature may be trusted to take care of the matter.

Dr. L. C. Ingersoll, of Keokuk, spoke of the objection urged against the use of arsenious acid—the after results must necessarily depend upon the after treatment. I apply iodiolized iron to remove the effect of the arsenious acid, in fact to antidote this poison. We have, in my judgment, no antiseptic equal to arsenious acid as a preservative. I could instance a case where I found upon examination, after a long absence, that the pulp was preserved absolutely perfect.

President Noyes.—I would ask if the iodiolized iron entirely removes the effect of the arsenious acid and how?

Dr. Ingersoll.—I cannot precisely explain the process, but I know that it does it. The iodiolized iron is laid down in the books as an antidote for arsenious acid.

Dr. Brophy, of Chicago, said a tooth properly and skilfully filled was much better, of course, than one carelessly treated. It was a source of much pleasure to him to confirm the experience of Dr. Black. I, too, oppose the use of ox chloride of zinc as not compatible with the parts. I have removed many caps where it has been used and found dead pulps. As to the use of carbolic acid I do not myself see the use of producing a coagulum. Why should we destroy to make well? I think we ought to avoid the use of everything tending to inflammation and irritation. As Dr. Newkirk has well said, we might use a spoon-shaped instrument. His idea is good. And, as Dr. Sitherwood has said, listerine is an excellent antiseptic. Temporary dressing of the exposed part so that it can subsequently be capped is, in my judgment, an effective and practical treatment.

I do not believe in the sometimes received and advocated opinion that the application of arsenious acid should be removed in twenty-four hours. I think forty-eight hours, or even two or three days will do better. I might, perhaps, say a week would be better still.

Dr. Spalding.—Then you think a week none too long?"

Dr. Brophy.—None too long, sir, nor even two weeks."

Dr. Spalding.—That's true.

Dr. Brophy (continuing).—I am inclined to commend the use of a heated instrument—heated to a white heat—to insert in the canal. Of course there is necessity to use it very speedily. The process is quick and painless. I favor, as a general practice, the saving of small portions of the pulp.

Dr. Ingersoll.—The main question that occurs to me in the solution of this problem is the condition of the patient. I have no difficulty in treating the case; it is only diagnosing the condition of the patient that gives me pause. The discussion here, it seems to me, is chiefly regarding capping when the condition is normal, but what's to be done when the exposed pulp is diseased; the condition not healthy? Like Dr. Black, I attach great importance to the fact that the pulp diminishes as age advances.

The Chair (Dr. Noyes).—This is the most satisfactory discussion of the treatment of exposed pulps that I have ever heard. Diverse views are here expressed and the methods of treatment here advocated are somewhat varying, but there is, I think, a general harmony on the main issue. In my view the conditions governing the treatment of the pulp are as readily ascertainable; the same, in fact, as the other tissues of the body. There should be simply antiseptic treatment with the least possible irritation and a careful covering up of the exposed parts. Ox chloride of zinc, for instance, stimulates, but whether it over stimulates is the main problem? These principles are the key to the matter, and the apparently diverse views here expressed are reconcilable, I think, if it be considered that good judgment and careful methods underlie all. (Applause.)

Dr. Crouse.—I call upon the man who converted me (laughter) to give his views. There he stands—Dr. Cushing.

Dr. Cushing.—I have little to say. This has been a good discussion, but one or two points may, perhaps, be elaborated. I was pleased with the position taken in the opening of the paper—that the condition of the patient should govern and determine the question of capping or not capping. Doubtless, many pulps ought not to be capped. Dr. Newkirk has well emphasized the necessity for skillful use of good instruments. I have, myself, had considerable experience in the capping of pulps, and I believe that by judicious treatment they can nearly always be saved. My experience is that the method is successful even with children. As to age, it is doubtful if it should be performed when the patient is over thirty-five years of age; it is then liable to be unsuccessful; but at forty I think failure is almost inevitable. Also, where there has been inflammation of the parts since maturity, success in capping is very doubtful.

Dr. Black.—We must not, I think, consider that success is doubtful, because there are some failures. I spoke of cases where patients came with pulps already dead, though not exposed. There may be incipient or chronic abscess, but the process of capping is ordinarily successful.

Dr. Newkirk.—Regarding the condition, I would say if the patient is healthy or has a smooth skin, that betokens a good condition. But I insist that the patient should be fully informed of the nature of the operation, and that the chances of failure are at least ten per cent. I think an error often obtains in removing the temporary filling too quickly after the pulp has been capped. It is better to leave it much longer—then there is less liability to after complaint.

Dr. Spalding.—I do not like to have this interesting discussion close without emphasizing one point, and that is, the importance of preserving the pulp in young subjects. Up to, say, sixteen years of age, the extirpation of the pulp and the fillng of the root canals is a very uncertain operation. Young practitioners may infer that they have a license to destroy pulps at any age. The age of the patient is an important consideration in determining the treatment.

Dr. A. W. Harlan, of Chicago, closed the discussion. He was of the opinion that pulps are very frequently capped too hastily. A patient calls, and the dentist having nothing else to do, perhaps, (laughter) immmediately caps the pulp; and this with the expectation of success. This is all wrong. A course of preliminary treatment is necessary. Nor did he believe in exposing pulps. He did, however, believe in trying to save them—especially the pulps of young persons. We should make the attempt in any case.

As an anti-septic, his experience led him to commend iodoform, mixed with oil of cinnamon, by which the odor was rendered less pungent. So prepared, iodoform was not only a good antiseptic, but a stimulant as well. Regarding the treatment he preferred ox. phos. zinc as the capping material. This should be protected and kept in position by a gutta percha filling, very carefully introduced. This prevents the washing away of the cap before hardening. At the close of his remarks the society adjourned.

[TO BE CONTINUED.]

GEORGIA STATE DENTAL SOCIETY.

The sixteenth annual meeting of the Georgia State Dental Society was held at Atlanta, beginning May 14th.

Dr. G. H. Winkler, of Augusta, President; Dr. A. G. Bouton, of Savannah, Vice-President; Dr. G. W. H. Whitaker. of Sandersville, Secretary, and Dr. H. A. Lowrance, of Athens, Treasurer. There were about twenty-five members in attendance at the opening of the session. Several new members were afterwards added to the Society.

Dr. B. H. Cathcing, of Atlanta, made the address of welcome, which was handsomely responded to by Dr. G. P. Campbell, of McDonough.

The President, Dr. Winkler, delivered the annual address.

Dr. W. C. Wardlaw, of Augusta, discussed the subject of hemorrhage from extraction. He said many persons had hereditary disposition to hemorrhage. Persons physically run down from intemperance and excesses were disposed to effusion of blood. It was doubtful if extraction should be performed in such cases. The smooth cut of a lancet was more liable to excessive bleeding than was a lacerated wound, and for this reason, if for no other, the use of the lancet should be avoided when practicable. Related a case of severe bleeding from the extraction of three teeth from the mouth of a lady whose family was predisposed to this trouble. His treatment consisted in the use of linen packing, saturated witn glycerine and tannic acid ; also used sandarach varnish.

Dr. Campbell never feared hemorrhage after extraction ; used the lancet freely, and always extracted teeth when necessary ; treated with per-chloride and per-sulphate of iron, or with soda bicarbonate. Had never had a case of hemorrhage that he could not stop in half a minute. Thought bleeding from the smooth cut of a lancet more easily controlled than that from a lacerated wound.

Dr. Wardlaw stated that while per-sulphate of iron controlled hemorrhage primarily, it induced it secondarily.

Dr. Catching thought the salts of iron were unsafe, and therefore their use was inadvisable.

Dr. R. B. Adair, of Gainsville, exhibited models of a case of irregularity which he had successfully treated. He spoke on dental pathology, and described a case of fungus growth around a tooth, a sarcoma of several months' duration; the tooth was extracted and the best medical and dental skill available was employed, but no relief was had, and the patient died recently in great pain.

Dr. J. A. Chapple, of La Grange, mentioned a case where a cauliflower growth followed extraction of a tooth. The patient died at the end of a year.

Dr. G. W. McElhaney, of Columbus, described a case which resulted fatally, although the cauliflower growth was repeatedly removed, and at last one-half of the jaw was amputated.

Dr. E. Parsons, of Savannah, has had several similar cases, but had lost none. He treated locally with zinc acetate, and sometimes found it necessary to resort to oxalic acid.

Dr. Catching stated that cancer of the inferior maxilla had been cured by the local employment of aromatic sulphuric acid. assisted by suitable constitutional treatment.

Dr. Wardlaw gave his theory of the case related by Dr. Adair. Thought there was a hereditary tendency towards malignant affections, fostered by the unfavorable surroundings, and the death resulted from blood-poisoning.

In case of hemorrhage, Dr. Parsons packed the socket with punk moistened with some hemostatic, and

Dr. R. W. Thornton, of Calhoun, used cotton dipped in sandarach varnish.

On motion of Dr. Whitaker, a committee consisting of Drs. Parsons, Lowrance and Carpenter was appointed to prepare resolutions on the death of Dr. H. C. Ford.

Dr. W. F. Tignor read a paper, "Our Duty to Our Patients." The doctor said people must be taught to keep their teeth clean. Digestion begins in the mouth. Clean the mouth in the morning thoroughly with a brush. After every meal pick the teeth and rinse the mouth. Rub the teeth with chalk or other powder twice a week. Mothers should impress on their children the necessity of keeping their teeth pure and bright.

Dr. Catching did not agree with Dr. Tignor about using soap in the mouth. He advised using the silk thread between the teeth to cleanse and rinse thoroughly after meals.

Dr. Chapple thought the alkali of the soap was useful.

Dr. Catching suggested diluted listerine as a fine wash for the mouth.

Dr. McElhaney asked about the carbolic soap for the mouth.

Dr. Winkler called Dr. Bouton to the chair and made a few remarks on the subject of cleaning the teeth. He advocated the use of soap as one of the best means to cleanse the mouth. Alcohol and prepared chalk cleaned the mouth well. He was pleased with listerine.

Dr. Catching still opposed the soap cleaning.

Dr. Parsons suggested the use of warm water as an excellent aid to purifying the mouth.

Dr. Tignor thought if soap was needed to clean a soiled hand it was good in a soiled mouth. He urged the need of training children to the habit of cleaning the mouth.

Dr. Wardlaw indorsed the anti-soap idea. He had observed the bad effect of soap on his patients. Soap was insoluble and would stick to the teeth, injuring the gums. He preferred the chalk.

Dr. Campbell thought that in the cleaning of the teeth dentists must suit the needs of each patient. Use whatever is best for the person. Some need alkali—others do not. He advised different mouth washes in different cases.

Dr. S. G. Holland said the care of the teeth should begin before the teeth come. Washes do good, but wise management is better. The parent must forbid the children being gorged with sweet meats, or eating between meals. Make them eat simple food at regular hours. The patriarchs had no use for tooth brushes and knew nothing about them. The insurance figures show improvement in people. Let the improvement be kept up. Parents must regulate the diet of their children.

Dr. Parsons indorsed Dr. Holland's remarks and believed more care in eating would reduce cases of dyspepsia a hundred fold.

This subject was passed. Before adjourning Dr. Browne suggested that some plan be devised for getting new practical experiences from the members. He moved the appointment of a committee of three to confer with members and see if they have any valuable information. Carried. The committee appointed was Drs. Browne, Wardlaw and R. B. Adair.

THURSDAY, MAY 15.

The Society met at 9:30 A. M., the President, Dr. Winkler, in the chair.

Dr. Catching stated that Dr. W. N. Morrison, a distinguished dentist of St. Louis, was present. Dr. Winkler, the President, extended a cordial invitation to Dr. Morrison to participate in the deliberations of the Society.

Dr. R. B. Adair read a paper on Riggs' Disease—Pyorrhea Alveolaris. Dr. Adair spoke of the uncertainty attaching to this disease. Generally more attention is given to the ravages of the disease than its cure. In treating this disease the first thing is to thoroughly remove all accumulations on the teeth, and also the dead margins of the alveoli. Then syringe out the pockets with a solution of per-manganate of potash. Paint thoroughly every 24 hours with saturated solution of iodine in creasote, and cover with mixture of tannic acid and glycerine. Continue this treatment for 100 days, or until the lost tissues are restored.

Dr. Catching stated that Dr. Riggs is preparing a work on the treatment of this disease.

Dr. Parsons asked if any one could give a technical description of Riggs' disease.

Dr. Morrison was called on. He had never found two men that could describe the disease. It has never been clearly defined. He believed the disease originated in the deposit of tartar on the teeth. It is a difficult disease. He opposed naming it Riggs' disease. It was a hundred years old. There is but one treatment—a careful manipulation of instruments to remove thoroughly the cause. You want a thin, narrow blade to get under the crust. Men are deceived as to the thoroughness of the work. Dr. Riggs' plan was to remove the diseased scale of bone, after which simple, but thorough, cleanliness is required.

Dr. Parsons had had much experience with this disease. Riggs' disease was a misnomer. Bad cases of it he regarded as incurable. But, if taken early and the progress arrested, it was easily curable.

Dr. Holland wanted to know the origin of the disease. He had cases where tartar was not the cause. Are such cases Riggs' disease?

Dr. Adair had confined his paper to the treatment of the disease. He supposed they were united as to the nature of the disease. It was all the same disease at different stages.

Dr. L. D. Carpenter, of Atlanta, asked him to say what was the cause of the disease.

Dr. Adair thought tartar always present.

Dr. S. A. White, of Savannah, found the light brown tartar the most difficult to completely remove.

Dr. Chapple said he had, like Dr. Holland, seen cases without tartar. He had never seen the disease in the case of an habitual tobacco chewer, though it occurred in smokers. Aromatic sulphuric acid was a remedy.

Dr. Catching suggested asking patients if they used salt food.

Dr. Carpenter mentioned a case of his. A gentleman, perfectly healthy, gradually lost his teeth, until the extraction of teeth in advance, and splitting and cutting out some of the alveolar process stopped the disease.

Dr. Adair thought this a case of necrosis.

[TO BE CONTINUED.]

DR. A. H. BEST, of Savannah, Ga., is the originator of counter-irritation pads, which are made of blotting paper, medicated with cantharides, capsicum or other suitable local remedies; after which one side is coated with celluloid varnish.

DR. BROWN, of Atlanta, Ga., has made a folding seated chair of slats of iron raised or lowered by cord and pulleys, which meets the wants of a traveling dentist admirably. Also a cheap condensing lamp to illuminate the mouth.

SOUTHERN DENTAL ASSOCIATION.

SIXTEENTH ANNUAL MEETING HELD AT LEXINGTON, KY., MAY 6, 7, 8 AND 9, 1884.

Reported expressly for the ARCHIVES OF DENTISTRY.

FIRST DAY.

The Association met in the Y. M. C. A. rooms, Tuesday, May 6, there being present, besides representatives from the various Southern States, a number from Ohio and Indiana, and one from Illinois.

At two o'clock P. M., the convention was called to order by the President, Dr. McKellops, of St. Louis. Prayer was offered by Prof. J. Taft, of Cincinnati, and the President presented his address.

Dr. A. O. Rawls, of Lexington, chairman of the Executive Committee, then delivered an address of welcome.

In the absence of the Secretary of the Association, Dr. J. S. Walter was elected Secretary *pro tem.*; and the minutes of the last session being read, were approved.

The Executive Committee reported the following order of meeting:

Morning session from nine to twelve o'clock.

Viewing instruments and material on exhibition by various dealers, twelve to two o'clock.

Afternoon session, two to five o'clock.

Night session subject to order.

DENTAL EDUCATION

Prof. R. B. Winder, dean of the Baltimore College of Dental Surgery, read a paper on Dental Education.

He first considered what educations is—it purposes and objects. Practically and theoretically it has been found necessary to have general, special, and ornamental education. Knowledge is confined to nature and her laws. As knowledge increases, the attainment of a general education becomes more difficult. The object being success in life, a young man should first be taught the essentials of success in his especial calling, and having attained them, it is his duty to cultivate and enlarge his mind in every way. Then he denounced in strong terms the wrongs perpetrated under the name of "female education," and argued that woman should be educated in the essentials of success in her pathway in life. Defining and explaining special and ornamental education severally, he held that that man is best educated practically who has most thoroughly mastered the essentials of success in his field of living—who is a success in his specialty. This brought him to dental education, and the founding of the Baltimore College of Dental Surgery by Chapin A. Harris' forty-six years ago, since which time many dental colleges have arisen, and many medical schools have added dental chairs to their faculties. This has caused great diversity of opinion as to the best method of educating dentists. He combated the idea that dentistry is a specialty of medicine. As did surgery, so has dentistry come to the front rank. Dentistry stands on these pillars—mechanics, artistic taste, and theory named in order of their value. A dentist deficient in either will never be a success. Practical education is necessary, and everything unnecessary must be discarded in teaching dentistry. Diagnosis is most important. Graded courses should be established, and diplomas should be granted on knowledge, not on the time spent in pursuit of it. There is a necessity for the cultivation of artistic taste, involving a study of nature. There is need for a study of physiognomy (especially as most of the muscles of the face have their origin and insertion in the maxillary bones), for the acquiring of an accurate knowledge of the laws relating to physical beauty, and a skillfulness in carrying out their demands, if we would give dentistry an honorable, reputable and enviable place among the professions.

Drs. Taft and Smith, of Cincinnati, Dr. Patrick, of Belleville, Ills., and others spoke on the subject, which was left open for further discussion.

Dr. H. A. Smith, of Cincinnati, and Dr. J. S. Cassidy, of Covington, Ky., were elected active members, and Dr. John J. R. Patrick, of Belleville, Ill., an honorary member of the Association, which then adjourned to meet at the office of Dr. Rawls at eight o'clock.

EVENING SESSION.—After opening, Dr. C. E. Dunn, of Louisville, was elected a member.

Dr. Patrick was called on to speak on operative dentistry in relation to regulating teeth. He said there were so many questions connected with the regulating of teeth that it was difficult to speak definitely. No two cases are alike in the displacement and the condition of the surrounding parts. Besides, there are defects on all sides. The only certain guide is a correct knowledge of the parts surrounding the teeth to be regulated and shifted. That teeth can be changed in position there can be no doubt. Nature has set the example by shifting them out of place; art can use means to get them in their places. The question of how to do it remains with the individual, to a great extent. Whatever successful means are used, they must inevitably follow certain fixed laws of mechanics, known ever since Archimedes explained the operation of the lever. The rest is a question of judgment. Time is absolutely necessary. Every tooth has a cell within the alveolar process. A tooth with a single root has only one cell, divided into two parts; a primary cell, embracing the neck of the tooth, and the root cell. The formation is more clearly seen in teeth that have more than one cell, as the bicuspids and molars. As all the teeth of a set have a differently formed cell, of course, if you want to shift teeth, they must be clearly understood. Take, for instance, the first bicuspid of the superior maxilla. Its roots are seldom separated, but it always has two canals, and sometimes two roots. The second superior bicuspid usually has two roots, the first external, the other internal; a primary cell in the neck of the tooth, and a dental septum that separates it from the adjoining tooth. The canal passes up through the tooth. There it has a root septum running up into the bifurcation. In shifting that tooth you disturb every one of those cells and septums. The lower molar has two connate roots, four separate canals, sometimes bifurcated, sometimes with four roots. As a rule, there are two roots connate, posterior and anterior. As all teeth have different surroundings, and are different as to support, thickness, form, and size, they require to be differently treated, to be dealt with intelligently. Once having begun, keep at it; go slowly. As one side excavates, the other will deposit a callous, which will become bone. When you change the position of the tooth you change the position of the cell; for wherever the tooth goes, there the cell accompanies it. You will find that with anomalous teeth there are anomalous cells. You cannot always tell by the crown the condition of the roots. When the crown is very large the roots will be very small; and when the crown is very small the roots will be very large. The teeth of the human mouth you will very seldom find equally balanced, but showing as much difference as between the appearance of one individual and another. In shifting teeth you must have one fixed point (two are better), and one movable point. You can remove teeth between two fixed points in any given direction, whether you use the split plate or any other method. The plate generally has more than one fixed point—it should never have more than two. A molar tooth is just as easily moved as a bicuspid. When you have two fixed points, one on either side, the probabilities of success are better.

Teeth that are on the outside of the arch of the superior set require more continued pressure or force to move them inwards than the same teeth if they were inside would require to move them to the outside of the arch, for the outside of the arch of the superior maxillary process is the weakest, whereas the inside is reinforced by the palate process, which gives it a greater power of resistance. The conditions are different in the inferior maxillary; in the inferior set the molar teeth have an inward inclination owing to the internal thin wall and the external thick wall which is reinforced in this region by the external oblique ridge. The external wall of this process commencing with the right second biscupid and extending round and ending with the left second bicuspid, is thinner, and consequently weaker than the internal plate or wall of the same region; it therefore follows that the line of strength and weakness intersect each other at the site of the second bicuspids of the inferior maxillary, and owing to this fact the lower jaw is more frequently fractured at the site of the bicuspids than at any other point. In extracting the lower molars they should be thrown or moved inwards and all the teeth anterior to the molars outwards; whereas the teeth on the upper jaw in removing them should be moved outwards or to the point of least resistance. Fortunately, the six front teeth are the ones that receive the most and require the most attention at our hands, and we have the molars for our fixed points.

Dr. Patrick answered a number of questions in regard to the extraction and movement of teeth.

Leave young teeth alone. Give them time even when you do regulate them. When you disturb a tooth hold it. Never use rubber except to get the tooth in place; then something firmer to keep it there. He would not attempt to regulate permanent teeth under fifteen years. Deciduous teeth have to be taken between the ages of four and five. Before four the roots are not formed, and after five they are beginning to absorb. The wearing away of the little cusps on the incisors is a good indication that the roots have calcified; and the teeth should never be moved till this is the case. The same rule will help in observing as to the time when the molars have developed. You have a sure sign in the incisors. He would take a patient at twenty-five, or thirty, or forty—if healthy.

If the tooth will not develop, make room for it to develop. A buried incisor should be relieved, even if the cusps are not visible. There are exceptions to every rule.

To fasten the ends of this wire (Dr. Patrick's apparatus) first select a back tooth, then make a piece of gold plate to fit snugly, and attach the slide to it with the screw. When these bands or the spring relaxes it may drop out, as the tooth moves. Then screw it up.

He did not propose to do anything impossible, but might move the lower molars out with this machine if he kept it on long enough.

As to hereditary development, he asked to be shown a crooked jaw and he will show crooked teeth. If you have a gothic jaw you have irregular teeth. Show him a placenta ill formed and he will show a monstrosity. It cannot be otherwise. So with the teeth. The same law governs the teeth that governs the hair of your head. You must work inside that law. In regard to heredity we find irregularity of the teeth in all races of men. The lower you go the more regular the teeth are. The Australian has more regular teeth than the Congo negro. His teeth resemble those of the chimpanzee and gorilla, both as to the form of the jaw and the teeth, more than do those of the European; they have less fissures. The molars have very few fissures, indeed only indications. The enamel is strong, and the teeth do not decay. The upper jaw rather approaches toward the ourang's. The higher we come the more mixed the races become. In America, Africa and Asia you find innumerable and diverse races. The different races must have crossed, and, in crossing, got imperfections as well as perfections. The European races are mixed probably more than any of the others.

[TO BE CONTINUED.]

SELECTIONS.

FILLING ROOT CANALS.

BY C. W. SPALDING, D.D.S., M. D.

[Read before the Central Illinois Dental Society.]

When the pulp of a tooth from any cause has lost its vitality, the necessity for its removal preparatory to the operation of filling the root canal will probably not be questioned. But the total removal of a devitalized pulp is not always an easy matter; on the other hand it is sometimes quite difficult, and the enlargement of the canals is occasionally necessary for its thorough accomplishment. The instruments commonly employed for clearing the canals are broaches, either plain or barbed. The raising of barbs upon a broach so much increases its diameter that it is then too large to pass into any but the larger canals. Consequently, for general use, the plain broach is our chief reliance. A few fibres of cotton wound obliquely upon the broach assist in the entanglement of the tissue and vessels of the pulp, and aid in its withdrawal. As a necessary prerequisite to success, the canals must be effectually cleansed previous to filling.

One frequent source of perplexity in the thorough accomplishment of this work, is the removal of an unkilled remnant of the pulp, near the extremity of the canal. It has many times been said that the substances usually employed for the devitalization of the main body of the pulp, are inapplicable, if not unsafe here. Such, however, has not been my experience, and I do not, after thirty-four years' practice of this operation, recall a single case where any inconvenience has followed the application, deep in the root canal, of the escharotic usually employed for the devitalization of the body of the pulp. Of course the quantity used should be proportionate to the bulk of the tissue to be acted on. If a broach which has been found by trial to pass readily into the canal to the sensitive point, be several times dipped into the dry escharotic powder, and as often carefully carried down the canal, a sufficiency will be brought into contact with the undestroyed part, and complete devitalization of the contents of the canal will follow.

Assuming that the canals have been properly prepared, the next thing is the choice of the material to be used as a filling. My experience covers the use of nearly all the substances that have been recommended for the purpose, including gold, tin, wood, whalebone, gutta-percha, shellac, oxychloride and oxyphosphate of zinc, and probably others that I do not now recall. All, I believe, except cotton. Cotton and creosote I have long held in such aversion, arising from the foul condition of the hundreds of root fillings of this kind that I have taken out,that I have never attempted their use.

At the beginning of the year 1849, I used gold—gold foil. This was folded into very narrow ribbons and then cut into short pieces, and these were carried into the canals by means of slender, somewhat flexible steel points small enough to be carried up the canal nearly or quite to the terminal foramen. These slender instruments, not being reduced to an absolute point, were capable of carrying a short bit of the ribbon, say a line or two in length, into a canal and condensing the same at its extremity. To fill a canal in this manner was a slow, yet tolerably certain process, and when carefully done, the results were usually satisfactory. Afterwards the use of gold foil was modified by winding tri-angular pieces upon broaches, allowing the point of the wrapping to cover the point of the broach, and carrying the gold into the canal by the aid of the broach. When in place, a reverse motion of the broach unwinds the wrapping, and the withdrawal of the broach leaves the gold in a favorable condition to be condensed laterally and vertically, by the introduction of a slender whale-bone point by the side of the somewhat loosened wrapping of gold. This method has the advantage of great facility, and in its results was found but little more certain than the former. Of late years this second method has been rendered more certain by the addition of the solution of gutta-percha or of shellac. If the latter is chosen the mixture should be quite thick—almost buttery. After the broach has been smoothly and firmly wound with gold, dip the point lightly into either of the above named solutions, and proceed to pack as before described, the object being to allow the gutta-percha or shellac to fill the interstices which might arise from an imperfect packing of the gold foil.

That method of root filling is to be preferred which most positively assures the complete filling of the canal, with a material unaffected by the influences to which it is necessarily subjected. Canals may be, and are filled with gutta-percha or shellac solutions alone; but I regard such fillings as inferior to those just above described. In the canals of lower teeth, I esteem oxychloride of zinc as preferable to any vegetable substance, but its use should be confined to the inferior teeth, on account of the uncertainty of making a complete filling in the upper jaw.

The use of soft gold wire, as practiced by Dr. W. N. Morrison, of St. Louis, is, I think, one of the best methods practiced or proposed. Its strongest recommendation is its positiveness ; the wire may be tried and withdrawn and reduced, or flattened, or otherwise changed, until it fits the canal tolerably well. It should then be luted with the gutta-percha or shellac solution, and then driven well home into the canal.

There is an element of uncertainty, greater or less, in all known methods, and in choosing from the various ones now practiced, that one should be selected which promises the most positive results. Perhaps all will not succeed equally well with any one. When the operation is not successful, it is often, but not always, the result of an imperfect closing of the canal at its apex. Sometimes the operation fails not from any defect in the filling, but from an unhealthy condition at or surrounding the apex of the root. This being external to the canal could not be affected by the character of the filling.

DISCUSSION.

Dr. Cushing.—I have listened with a good deal of interest to the reading of this paper. Dr. Spalding is possessed of a manipulative ability that is peculiarly his own. There are some things that he seems to be able to do that nobody else can do—that he cannot demonstrate, or teach any one else to do as he does them. One of these is the ability to fill root canals with gold foil with a comparatively high degree of success. But I do not believe that his method is the best method for anybody, not even as practiced by himself. I am very certain it is not the best for us, nor for the ordinary practitioner. I do not believe it is possible to fill the roots of teeth in any case, with gold foil, or wire, or both, as perfectly as they may be filled by other means. If it is not possible under the most favorable conditions, what shall we say of those cases where the canals are small, tortuous, and difficult of access? There are canals where the finest broach cannot be made to pass. Again, there are canals that are funnel shaped at the apex of the root—much larger there than at a point, say a fourth of an inch from the end. I should like to know how any one can pack foil to seal such a canal. How can he *know* when he has it filled?

There has never yet been discovered anything for filling root canals that, in my judgment, is equal to the gutta-percha and chloroform mixture. With this properly employed, one may be reasonably certain that he has hermetically sealed the canals, and he can demonstrate satisfactorily that this *may* be done by using teeth out of the mouth. I have filled roots with fine canals, and even ramifications so small as to be imperceptible-to the eye, with the gutta-percha. I know of no other filling substance which will follow out the smallest channels in a like manner, and it is an innocent substance. If you should happen to overfill, if any of it is passed through, its presence is non-irritant—the tissues endure its presence, and no harm results.

Dr. C. related a case where the mixture had followed the path of an old sinus till it had appeared externally through the gum, but with no unfavorable consequences. He then described his method of employing it, pumping it up to the apex with a broach slightly wound with cotton, not caring even if a little should pass beyond the apex.

Dr. Harlan.—I fully indorse all that Dr. Cushing has said as to the impossibility of filling root canals perfectly with gold foil, or gold wire ; and my experience fully bears out the good opinion of the gutta-percha. My method of using it is slightly different from his, in that I use the gutta-percha cone, dipped in eucalyptus, after I have pumped the mixture in very much as he does.

Dr. Swain.—I have taken the pains to examine a good many teeth out of the mouth, making sections of the same throughout their entire length, to ascertain the characteristics of the root canals. The canals are often tortuous, flattened, or constricted. There is very often a stricture at a point half way or more toward the apex, from which the *canal* widens considerably, giving us the funnel shaped opening mentioned by Dr. Cushing.

Dr. Swain illustrated these conditions on the board. In answer to the question as to whether he ever enlarged the strictured canals Dr. Swain said: "Yes, if the canals are so small as to make it difficult or impossible to pass a broach, I enlarge with a Gates-Glidden drill, simply through the stricture. In filling, I use a small, fine-pointed cone of gutta-percha, dipped in oil of eucalyptus, and carried to its place on the end of a broach.

Dr. Taylor desired to call attention to a point he did not remember to have seen mentioned lately—one that he esteemed of a good deal of importance, namely, the benefits to be gained by leaving the canals as nature had finished them, unmarred by burr or drill. The walls of one of these pulp canals, under a magnifier, exhibited a surface polished to the most perfect degree of smoothness, thus forming a natural channel adapted to the easy flow of a semi-fluid filling. Whenever an instrument is touched to these surfaces, however, they are at once so roughened as to impede, rather than assist the passage of substances. Hence, we should as a rule, be content with removing the debris from the canals.

CASE OF SPASM OF THE MUSCLES OF THE FACE AND CATARACT DUE TO DENTAL IRRITATION.

BY HENRY SEWELL, M. R. C. S., L. D. S.

[Read before the Harveian Society.]

The patient was a middle-aged lady, unmarried. She had suffered all her life from bad teeth and neuralgia. During late years the suffering had frequently been acute, and she has a constant succession of alveolar abscesses, with great swelling of the face, especially on the right side. She had long been under the care of Dr. W. Hoffmeister, of Cowes, who had frequently urged her to have her teeth attended to, but without avail. The patient could not overcome her dread of dental operations. About two years and a half ago, during 1881, her right eye became painful at times, apparently from neuralgia. In January, 1882, contraction of muscles of that side of the face took place, and had persisted ever since. In July of that year, drooping of the right eyelid came on suddenly, and she then discovered that she had lost the sight of her right eye. Dr. Hoffmeister, believing that her condition was due to dental disease, and having again in vain urged her to have her teeth examined, sent her to Dr. Ferrier. He reported of the case as follows:

She was a very nervous middle-aged spinster, with facial spasm and apparent neuralgia on the right side of the face and head. She said she could not open her right eye; but, on examination, this was found to be not exactly true, as with effort she could do so.

The closure of the eye was due to spasm of the orbicularis muscle, and was not ptosis. She would scarcely allow her head or face to be touched : but there was evidently great tenderness in the region of the right upper canine. The neighboring teeth were much encrusted with tartar, and the gums looked red and swollen. The right lens was almost opaque. Believing that the cause of the neuralgia, the facial spasm, and the cataract was in the dental disease, Dr. Ferrier insisted that she should have the teeth set right or extracted. That the dental irritation was the cause of trophic disorder leading to cataract, Dr. Ferrier considered most probable, looking at all the circumstances of the case, and the fact that the symptoms were entirely unilateral.

The patient was at length induced to have her teeth examined, and came to me. I found, in the upper jaw, the stumps of some molars, and the bicuspids, canines and incisors, except the left central and lateral incisor. In the place of these was a vulcanite frame, with artificial teeth, attached to the neighbors. This had not been removed for years, and, as well as the rest of the teeth, was covered with tartar. The upper teeth were all carious, and had been the centres of long standing inflammation. The right canine was broken down nearly to the gum. Considerable thickening and swelling extended upwards over the root ; and pus could be pressed from the gum through small fistulous openings over the roots of all the teeth. The lower teeth, of which about ten remained in front, were hidden beneath an enormous mass of tartar, which extended full half an inch over the floor of the mouth. The patient's confession that she has endured years of incessant pain and discomfort from her teeth through dread of dental operations, was amply borne out by examination. Nitrous oxide was administered on two occasions, and the upper teeth were extracted. The tartar was gradually removed from the lower teeth, and an upper set of teeth was provided. Within two days of the extraction of the teeth, the facial spasm entirely disappeared. The patient's health rapidly improved, but no change took place in the damaged lens.

This is the first case of disease of the eyeball due to dental irritation with which I have met. I see cases of neuralgia in the neighborhood of the eye very commonly, and cases of neuralgia of the eyeball less frequently, in which the cause is easily traceable to the teeth, the eye being perfectly healthy. The pain in some cases is attended by lacrymation ; in a few with muscular twitchings of the face. The most frequent condition of the teeth giving rise to the neuralgia and other symptoms is caries, with exposure and chronic inflammation of the pulp. Patients are often unconscious of the condition of the teeth, the pain being distant and the teeth not aching. Touching the exposed pulp, or directing a stream of cold water on to the tooth, or into the cavity, will usually bring on a paroxysm of the distant pain and establish a diagnosis where doubt exists. Dental periostitis, exostosis, and necrosis, and also impacted lower wisdom-teeth, are less common causes of neuralgic pain.

From a paper lately read at the Odontological Society by Mr. Henry Power,[1] I learnt, with some surprise it must be confessed, that Mr. Power and numerous first-rate ophthalmic authorities, British and Foreign hold the opinion that dental lesions are very frequently the cause of serious diseases of the eye. Mr. Powers lays it down as a maxim to be generally observed, that in all cases of threatening glaucoma, especially when this is associated with ciliary neurosis and obscure pains in the temples and maxillary orbital regions; in all cases of mydriasis, and probably of myosis, originating without apparent causes; in all cases of sudden paralysis of either of the orbital muscles, or of loss of sensation in the absence of cerebral symptoms; in all cases of phlyctenular disease of the conjunctiva; in all cases of ulcers of the cornea resisting ordinary treatment; in all cases of sudden failure of accommodation, especially in young children; and, finally, in cases of exophthalmia, the condition of the teeth should at least be examined, and, if faulty conditions present themselves, these should be at once rectified, and then one at least of the possible causes of each of the diseases will be removed. To this list must now be added cataract; for, although Mr. Powers tells me he has not himself seen such an one, he accepts the case I have narrated as probably due to dental irritation.

Mr. Powers gives many cases of his own and of other well known observers—Hermann Schmidt, Galezowski, and von Grafe—in support of his opinions; and these opinions were corroborated by other ophthalmic surgeons in the discussion at the Odontological Society. Mr. Power points out the various ways in which diseased action about the teeth may reach the eye. These are (1) by inhibition; (2) by trophic or vaso-motor influence (under this heading Mr. Power would place my case); (3) by extension of neuritis; (4) by reflex irritation, or sympathy.

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[1] "On the Relations between Dental Lesions and Diseases of the Eye," by Henry Power (*Trans. Odont. Soc.*, November, 1883).

I must express no opinion upon these views; but I may repeat I have never, with the one exception, met with a case of eye-disease in which there seemed reason to suspect diseased teeth as a cause; that is, I have never had such a case referred to me as dental surgeon in hospital or in private practice.

I trust my case may be considered worthy of record and of discussion; and, in order to stimulate discussion, I have ventured to cite the recent *apropos* utterances of Mr. Henry Power.—*British Journal of Dental Science.*

TRANSLATIONS.

FROM THE GERMAN, BY LOUIS OTTOFY, D. D. S.

In the January number of the Correspondens Blatt für Zahnarzte there appeared an interesting article by Prof. Ferdinand Cohn, of Breslau. The present time, which is so prominent in commemorating the anniversaries of great men and great occurrences, seems a proper one to refer to the fact, that, about two hundred years ago, one of the most important discoveries was made in Holland.

In a letter written September 14th. 1683, in Delft, by Antony von Leouwenhock, and addressed to Francis Aston, F. R. S., of London, he makes the statement that, with the aid of his microscope, he discovered in the white substance lodged between his teeth, living animalculæ, capable of rapid movements. These were the first bacteria seen by human eye. Leouwenhock describes several species so correctly, that they can be recognized without difficulty. The rod-shaped, which are found so seldom, but which are characterized by a lively motion, resembling that of a fish cutting through the water, are bacilli; the smaller species, which is characterized by circular movements, are bacteria; a third species, which is characterized by twisting motions, are fibrios; the smallest, which are oblong or globular, and which swarm in large numbers, similar to gnats, we take it for granted are micrococci, and their indistinctly visible motions, must be considered a deception.

The main mass consists of parallel lines of the same thickness, but of dissimilar length, although motionless; these resemble bacilli, being undoubtedly leptothrix buccalis. With naive clearness, Leouwenhock expresses his astonishment, that, notwithstanding the fact, that he carefully cleans his teeth, there are in his mouth apparently more animalculæ than there are human beings in all the provinces of Netherland. A similar number he finds in the mouths of women, children and the aged.

The drawings which he attaches to his report made to the Royal Society at London, in September, 1692, are still more correct than those of September, 1682, nine years previous. Until within a decade, there were no better observations or representations of bacteria extant. In an astonishing manner, the same man, who, two hundred years ago, opened, in the discovery of bacteria, the invisible world to human eyes, at the same time reached the limit which, up to the present time, has not been passed. Even though he may not have been aware of it, he, by his discovery, opened a new field to science, which has only recently led to important conclusions in regard to fermentation and disease.

JOURNALISTIC.

"Reading maketh a full man; conference, a ready man; and writing, an exact man."

In the *Southern Dental Journal* Dr. E. M. Allen states that Grimes' No, 2 Alloy when made into an amalgam became after six months very soft, was easily scraped or picked away and asks "Why this is thus ?" I answer, for the very good reason that the alloy in question contains a large proportion of cadmium.

"Dental Cosmos," Dr. J. L. Williams' paper on Embryology, is continued in the April number and proves one of the most interesting on the subject that has yet been published. It places its author in the front rank of investigators.

Also paper by E. T. Darby, M. D., D. D. S.,on the Etiology of Caries at the Gum-margins, etc., read before the Odontological Society of Pennsylvania. In the discussion of this paper, the acid, the alkaline and the mechanical theories were quite fully discussed. Prof. Truman took the ground that this kind of decay took place chiefly in the night when the entire mouth is in a state of rest, and when also the secretion of saliva is very scant. Its occurrence mostly at middle life he thinks is owing to a change in the oral secretion at about this period.

The *Odontograpnic Jonrnal* contains an article on the development of bone from fibrous connective tissue, by Dr. Carl Heitzman of New York. He says:

In the shaft-bones of human embryos ten to twelve weeks old, when no trace of calcification is yet noticeable, the cartilage is found to be surrounded by a delicate fibrous investment—the perichondrium—between which and the surface of the cartilage there is a broad layer of medullary tissue. From the latter tissue arises the future cortex, simultaneously with the calcification and ossification of the cartilage in the center. At the fourteenth week there is already a distinct cortex around the diaphysis, at the same time when the transformation of the cartilage into medulla and cancellous bone has also commenced in the central portion of the diaphysis. The cortex and the calcified cartilage occupy about the same height, the middle portion always being the standing-point for their formation. Both portions, however, at first exhibit the cancellous structure. while the formation of regular lamellæ begins to appear much later.

From single medullary corpuscles often grouped together, basis substance originates, which is at once infiltrated with lime salts. The embryonal condition is next re-established in these corpuscles by liquefaction of the basis substance, and they are again plastids, which may afterward coalesce to form a larger mass. The originally formed bone-tissue is not permanent.

The bony trabeculæ in turn are repeatedly reduced by liquefaction of their basis-substance to the embryonal or medullary condition,and new bone-tissue continues to form up to the time of full development of the body.

New tissue forms exclusively from embryonal or medullary tissue, and an already formed tissue must return to its embryonal condition, by liquefaction of the basis-substance, before a new tissue can arise. An augmentation of the bulk of a tissue can take place only by new formation of the living matter of the embryonal corpuscles, that is an increase of the number of embryonal corpuscles.

An already formed bone, being deprived of its basis-substance either by advancing growth or by the inflammatory process, at once falls back into the bioplasson stage, and exhibits first bioplasson territories, which later again divide into medullary corpuscles. All territories and all medullary plastids remain interconnected by means of delicate filaments, which traverse the surrounding light rims, and such a connection is also established with the adjacent reticulum of bioplasson of unchanged bony basis substance.

We commend the article to every one interested in the study of microscopical morphology,

British Journal of Dental Science:

Dentist's Fees in the Good Old Days.—The following curious advertisement has come down to us, through just a century of time. It is interesting, as giving one an inkling of how the profession lived, and charged we may add, in the good old days: "Martin Van Butchell,Surgeon Dentist,attends at his house in upper Mount-street, Grosvenor Square, always from 10 till 4; open till dusk. Advice £1.10s.; taking out tooth or stump £5.5 s.; a whole under row, £42; upper row, £63; an entire set, £105; natural teeth £10.10 s. each, No transplanting. No annual patients. N. B.—The money paid first. "This was the doctor who used to ride a pony in Hyde Park, painted in various brilliant colors; and who kept the embalmed body of his late wife in a glass case in his drawing-room.

Dr. P. Calvo recommends the use of oxide of calcium, (quick lime pulverized), for overcoming the sensitiveness of dentine. The cavity should be thoroughly dried before introducing the lime. The sensibility of dentine is rapidly lost while it would seem that the pulp has its vitality in no way impaired. No change in the color of the teeth occurs. Hydrated calcium (slacked lime) acts similarly but less rapidly.

The Municipal Council of Paris has arranged to have a periodical inspection of the teeth (as well as the eyes and ears) of the public schools.

New England Journal of Dentistry:

The Editor doubts that mercurialism is caused by "vulcanite plates;" we doubt it so much that our doubt is almost conviction."

"Every sore-mouth is right away attributed to mercury." Non-conductibility and defective smoothness are claimed to be the chief causes of that condition of the oral mucous membrane, which is charged upon red vulcanite.

Of Antiseptics the editor says:

"Dr. Koch of Berlin, has made experiments with corrosive sublimate,and finds that its antiseptic effect begins already with a dilution of one, to two hundred thousand. In a solution containing only one, to five hundred thousand, no germs can any longer exist; a solution of one, to twenty thousand destroyed the life of the anthrax germ in ten minutes; in a solution of one, to one thousand, sublimate kills germs almost instantly."

The same journal notices the death, by chloroform, of the wife of a prominent physician of Portsmouth, March 9th, administered for the extraction of teeth. Also, three deaths from chloroform at Baltimore since October, 1882.

In the *Independent Practitioner* Dr. J. L. Williams, of New Haven, Conn., describes the occurrenceof an impacted palatine root of the second superior molar, the buccal roots being absent, which had caused swelling, followed by a small opening in the gum. The first and third molars were in contact, and the patient had no remembrance of the loss of a second molar. The root was disclosed by the removal of the external wall of bone down to the alveolar margin, and subsequently removed, when the opening healed rapidly, leaving, however, a marked depression.

In an article on Dental Education the editor says: "Within the past month a 'student' made us a visit and unwittingly revealed the fact that 'he is matriculated at a dental college, but has never yet visited it.' Constructively he is now supposed to be attending lectures, while he has never even been in the city in which the college is located. Next winter he expects to attend the last half of the term *as a second course student*, and in the spring of '85 to graduate with all the honors attendant upon an extended term of study."

The name and location of any dental college that indulges in such practices should certainly be given to the profession. How otherwise are we to know which institutions are deserving of patronage and which are not ? So long as such things are concealed they are likely to be continued. Exposure is the only sure cure. J. H. S.

LIEUT. RAY, now resident at the American Arctic Colony, states that steel loses its temper and becomes soft from the effect of excessive cold similarly as it does when heated.

MISCELLANY.

To MAKE CORKS AIR-TIGHT AND WATER-TIGHT.—A German chemical journal commends the use of paraffine as the best method of making porous corks gas-tight and water-tight. Allow the corks to remain for about five minutes beneath the surface of melted paraffine in a suitable vessel, the corks being held down either by a perforated lid, wire screen, or similar device. Corks thus prepared, the writer says, can be easily cut and bored, have a perfectly smooth exterior, may be introduced and removed from the neck of a flask with ease, and make a perfect seal.

THE "setting of gypsum" is the result of two distinct phenomena. On the one hand, portions of anhydrous calcium sulphate, when moistened with water, dissolve as they are hydrated, forming a supersaturated solution. Again, this same solution deposits crystals of the hydrated sulphate, gradually augment in bulk, and unite together.—*Scientific American.*

PEROXIDE OF HYDROGEN, because of cheapened processes of preparation, is coming into general use. It is a colorless fluid, and in decomposing gives off four hundred and seventy-five times its volume of oxygen. As a disinfectant for the sick-room it probably has no equal. As a bleaching and cleansing agent, and as an article for the toilet, it is very useful.—*Med. World.*

ORAL PATHOLOGY.—A red line on the gums, with fetor and metallic taste, indicates ptyalism, a blue line, lead poisoning; great sponginess, with sloughing and great fetor, scurvy; a red line about the teeth and along the gums, periostitis; purple gums and purulent discharge, necrosis; gums hot, red, swollen, very tense, phlegmon; gums inflamed and soft, with fluctuations, alveolar abscess; swollen gums, fetid discharge, mucous patches, shallow ulcers under the tongue, eroded palate, eruption of mouth, skin and scalp, gums everted, fetid matter from necks of teeth, syphilis; a white coated tongue, indigestion; a brown, dry tongue, depression blood-poisoning, typhoid fever; a red, dry tongue, inflammatory fe ver; a red, glazed tongue, general fever, loss of digestion; a tremulous, moist and flabby tongue, feebleness, nervousness; a glazed tongue, with blue appearance, tertiary syphilis.—*Independent Practitioner.*

INEBRIETY AND LIFE INSURANCE.—The London Provident Temperance Insurance Company was organized forty years ago, designed only to insure temperance men. Last year they published a very interesting table of risks covering a period of seventeen years, and comparing them with other companies who did not make so positive a distinction in requiring all insured to be teetotalers. This table was made to show the difference between this and another company whose number of insured was the same or nearly so. The expected and actual deaths are very clearly brought out in each year.

The temperance society, in seventeen years together, had a mortality of seventy and one-half per cent. of the expectancy, or twenty-nine and one-half per cent. below the expectancy. In the other company the mortality was ninety-eight and one-half per cent., and only one and one-half per cent. below its expectancy, showing a superiority of twenty-eight per cent. in favor of the temperance society.

The inference from this is significant, and the inquiry, can this difference represent the mortality from drink directly or indirectly, and would the actual death rate be diminished twenty-eight per cent. if persons should totally abstain? are questions that will be answered in the future.—*Pharmaceutical Record.*

NECROSIS OF JAW DUE TO A FRAGMENT OF TOOTH.— Dr. Post narrated the following case: A sequestrum of the lower jaw, which he presented, was removed six or eight weeks ago from a young man, who, about two years before, applied to a dentist to have a bicuspid extracted. The tooth was broken, and the principal part of it was left behind; no immediate irritation followed, but, after a lapse of a year and a half, inflammatory swelling occurred over the bone, and portions of dead bone were discharged, together with the remnant of the tooth. For a long interval thereafter no fragments of bone were discharged. When the patient applied to Dr.

Post there was a sinus leading to roughened bone. He cut down and removed the sequestrum shown. The special interest of the case was with reference to etiology. The necrosis came on at a somewhat remote period after the breaking of the tooth, a part of which was left behind; then irritation increased until a considerable portion of the jaw had to be removed—*Proceedings N. Y. Med. and Surg. Society, in N. Y. Med. Journal.*

TEMPERAMENT AND TEETH.—When the artificiality of artificial teeth is noticeable, the dentist has failed in a most important part of his work. J. Foster Flagg has shown some of the causes of these mistakes. Starting from the four basic temperaments, bilious, sanguine, nervous and lymphatic—following the marked distinctions of each through the various sub-classes of mixed temperaments—he shows how important is a thorough study of temperament.

The bilious temperament is marked by teeth that are bronze yellow, large and inclined to angular, set firm and close, with gums heavy and firm, but inclined to angularity; the teeth of the sanguine are creamy yellow and inclined to transparency, well proportioned, smooth, moderately firm, with gums round and full; the nervous have pearl blue or gray teeth, with length predominating over breadth, inclined to transparency and with gums delicate, shapely and fine; the teeth of the lymphatic are pallid and opaque, or muddy in coloring, large but not shapely, loose and flat, incisors devoid of depressions and elevations and the gums thick and undefined in shape.

While a knowledge of the different varieties of the teeth naturally belonging to persons of different temperaments is thus seen to be important, in order that there may be a proper correspondence of the teeth with other physical characteristics, we suppose there is to be commended a sort of Darwinian selection, which will give each subject who has thus to be supplied with artificial teeth the advantage of the best selection in the class to which he or she belongs. This may be done without "associating the massive tooth of the bilious with the pearl blue color of the nervous, or the long narrow teeth of the nervous with the bronze yellow of the bilious," as is now occasionally done by some who, while they may be good dental mechanics, are certainly not dental artists.—*Scientific American.*

BIBLIOGRAPHIC.

GORGAS' DENTAL MEDICINE.

A brief mention of this work appeared in the preceding number of this journal. Since that notice was written we have given the work a careful examination, and without hesitation repeat the opinion then expressed, that it contains much valuable information, and is a most useful book to both student and practitioner. The work is chiefly a compilation, but the volume contains a large amount of matter that has heretofore only been accessible by consulting a number of medical works. To have this material brought together in one snug volume is a great convenience. That such a work has long been needed, is evident to all; and so far as this work supplies that want, it will prove a most welcome contribution to dental literature. That it is a complete and perfect work, should not be claimed, for it in part only, fills the place it was designed to occupy. In our opinion it contains a good deal that might have been advantageously omitted. But who has ever written a text-book, upon a subject on which so little has heretofore been published, that in its first edition did not fall far short of perfection?

Lest it may be said that we are dealing only in generalities, we will specify some of its objectionable features. Take for instance the large number of remedies recommended in cancrum oris. In passing through the volume we noticed no less than seven prescriptions for that disease. The student would naturally ask "Which of these remedies shall I first prescribe?" The author expresses no preference for either of the seven, and when so many of apparently equal worth are presented, the student will naturally hesitate in his choice of a remedy for this rare disease.

Again the prevalence of astringents in prescriptions for affections of the mucous membrane and soft tissues of the mouth is remarkable. We had supposed that such astringents as oak bark, etc., were pretty nearly superseded in dental therapeutics. So far as the field of our individual observation extends, they have been out of use for many years.

The application of tincture of arnica to abraded surfaces, as advised, seems to have been not well considered. Further on, the tincture of calendula is recommended for the same purpose. Its superiority over arnica for the purpose indicated is so great that the admission of the former advice would have been no loss.

On the other hand the chapter on diagnosis is one of great value, and there are many excellent formulas to be found in the volume. Some of the latter are, however, rather antiquated. In these times, when the tendency in medicine is so strong toward the employment of single remedies, it looks a little strange to read a prescription containing nine ingredients.

The work is well indexed, which in a book for reference is a very valuable feature, and the publishers have done well their part. In conclusion we take pleasure in saying that it is beyond question the best work of its kind extant, and deserves a wide circulation.

SIGMA.

PAMPHLETS RECEIVED.

Annual circular of the Dental Department of the University of Maryland. 1884—'85.

Annual catalogue of the Baltimore College of Dental Surgery. 1884—'85.

Transactions of the quarter centennial session of the Indiana State Dental Associaiion. June 1883.

Annual announcement of New York College of Dentistry, 1884—'85, and catalogue for 1883—'84.

The twenty-ninth annnal announcement of the Pennsylvania College of Dental Surgery, Philadelphia, Pennsylvania. Session 1884-'85

SOCIETY NOTICE.

The twentieth annual meeting of the Missouri State Dental Association will be held at Sweet Springs, Mo., commencing Tuesday, July 8th, and continuing four days. Reduced railroad and hotel rates have been secured, and a large attendance is expected. Every member of the profession is cordially invited to attend. For programmes and other information address Dr. G. W. Tindall, Chairman Executive-Committee, 1108 Main St., Kansas City, Mo.

G. W. TINDALL,
S. B. PREVOST, } Committee.
E. E. SHATTUCK,

AMERICAN DENTAL ASSOCIATION.

The twenty-fourth annual session of the American Dental Association will be held at Saratoga Springs, N. Y., commencing at 10 o'clock, A. M., on Tuesday, August 5th, 1884.

GEO. H. CUSHING, Rec. Sec.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The second annual meeting of the National Association of Dental Examiners will be held at Saratoga Springs, N. Y., on Friday evening, August 8th, 1884.

All Boards of Examiners are urgently requested to send representatives to this meeting, as matters of importance are expected to be brought before it.

GEO. H. CUSHING.

PENNSYLVANIA STATE DENTAL SOCIETY.

The 16th annual session of the Pennsylvania State Dental Society will be held at Wilkesbarre, Pa., July 29th, 30th and 31st, 1884. Special rates to delegates and their families at the hotels. Orders securing special rates by rail on the various roads, will be furnished upon application.

W. H. FUNDENBERG, Cor. Sec.

958 Penn Ave., Pittsburg, Pa.

CHICAGO DENTAL SOCIFTY.

At the regular annual meeting of the Chicago Dental Society, the following officers were elected for the ensuing year:

President, A. W. Harlan, M. D. D. D. S.; First Vice-President, F. H. Gardiner, M. D. D. D. S.; Second Vice-President, T. J. Kester, D. D. S.; Recording Secretary, James G. Reid, D. D. S.; Corresponding Secretary, J. N. Crouse, D. D. S.; Treasurer, E. D. Swain, D. D. S.; Librarian, W. B. Ames, D. D. S.; Executive Committee, Geo. H. Cushing, D. D. S., J. N. Crouse, D. D. S., Edmund Noyes, D. D. S.

EDITORIAL.

The last form (16 pages) of the April number of this journal contains some omissions and so many typographical errors that an apology is due to our readers for this want of accuracy. This form was not read by the regular proof reader of the ARCHIVES, but was hastily done by another, not familiar with dental technology. Hence the inaccuracies.

The publishers of the ARCHIVES are frequently requested to have attention called, editorially, to advertisements sent them for publication. The admission of such notices into our reading pages would be contrary to the policy adopted by this Journal, and, if generally practised, would be of little avail to advertisers. The publishers offer to their advertising patrons, every facility that the advertising department affords, but they have no control over the literary conduct of the Journal, and, therefore, cannot comply with such requests.

DESCRIPTIVE SKETCH OF THE SPIRIT LAKE REGION (NORTH-WESTERN IOWA).

The Spirit Lake Region is one of the most picturesque in the great north-west, so near to the Minnesota line that the topography of the country is similar to that of this noted State. One of the curiosities of this section is Sunken Lake. This is a body of water several acres in extent, so clear that tree trunks, branches and roots that once grew upon the surface of the ground can now be distinctly seen at the bottom of the lake.

Mounds, and other lakes of great beauty abound in this neighborhood.

The city of Spirit Lake is a thriving town of goodly proportions, and the hotel accommodations are ample and first-class.

The salubrity of the climate and the abundance of game make this an attractive resort for the angler and hunter as well as for those who seek recreation and rest.

PUBLISHERS' NOTICE.

To the end that there may be no possible misunderstanding of its position, the publishers of the ARCHIVES OF DENTISTRY desire to reaffirm, as emphatically as words can state it, that this journal is edited, printed and published in the interest of the entire dental profession.

Conceiving that there was a field, as wide as the area in which the English language is spoken, for such a publication, and that the profession at large desired such a fearless out-spoken representative of an interest, neither sectional nor bounded by the claims of manufacturers alone, the ARCHIVES OF DENTISTRY was established, as the organ of no especial class, no dental house, no favored locality, but as the mouth-piece of the dental profession as a whole.

We have reason to feel gratified over the reception thus far accorded our journal, and it is a source of satisfaction that so large a measure of support is accorded it, by those who, like ourselves, have the interests of the entire profession always in view. The need of an independent press was never so strongly felt as now. In several lines of trade what have been not inaptly designated "House Organs" have endeavored to foist themselves upon trades or business, to print pseudo trade journals, containing chiefly advertisements of their own wares and price lists of the same,rather than to issue circulars or the ordinary commercial form of prices current. The evil so grew that the attention of the Postmaster-general was called to the abuse of the mail privileges by these houses in sending out, as bona-fide journals with a recorded subscription list, mere advertisements of their wares. The above abuse has been so far remedied that these pamphlets, most of which are given away, like a cheap chromo, to patrons, had to take on at least the semblance of legitimate periodicals, and to record the names of persons as subscribers, in order to be entitled to entry at the resident postoffice, as "second-class matter."

The dental profession has also been weighted down in the past—and to some degree the abuse still exists—with "House Organs," that is to say with publications nominally representing the profession but in reality issued as a mere adjunct of some manufacturing firm, or in the interest of some special preparation. With these the ARCHIVES OF DENTISTRY has neither part nor lot. Its office and functions are entirely different. It has entered upon a field of usefulness so large that to even consider these special interests would be to dwarf its exalted mission. Entirely independent, therefore, of all these limitations, we shall continue to represent the honored profession as such, in the full confidence that those whose scientific attainments, acumen and distinguished success in the avocation they honor, will never waver in support of a journal laboring with them in a mission so useful and so fast becoming a necessity to all mankind.

THE

Archives of Dentistry.

A Monthly Record of Dental Science and Art.

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ON THE INFLUENCE OF MICRO-ORGANISMS IN THE PRODUCTION OF CARIES.

BY ARTHUR S. UNDERWOOD, M. R. C. S., AND L. D. S., ENG.
Lecturer on Dental Anatomy and Physiology at the Dental Hospital of London Medical School, Etc.

Read before the Odontological Society of Great Britain, April 7, 1884.

Mr. President and Gentlemen:

Mr. Milles and myself have so much to lay before you to-night in the form of evidence concerning the part played by micro-organisms in the production of caries, that we feel confident you will excuse us if we go straight to the matter in hand without an unnecessary waste of time in the form of preamble.

It is, however, necessary to state that we only propose to discuss the purely pathological side of the question to-night, and that only so far as the dentine alone is affected.

As we stated in 1881, we will consider that the initial stage, that is, the enamel destruction, is probably little more than a chemical solution of the tissue by an acid or acids; but we are inclined to believe that the greater part of such acids are the result of fermentation, a process which is entirely dependent upon micro-organic life, as has been amply proved by Pasteur, Lister, and others.

As the result of the decomposition of albuminoids, numerous substances are formed in the mouth—peptones and other similar bodies, fatty acids, acetic, formic, butyric, malic, lactic acid, etc., and in some cases sulphuretted hydrogen and ammonia are produced in large quantities. This decomposition is directly produced by the vegetation of micro-organisms.

A very simple illustration of this fact is obtained by filling two bottles with neutral saliva and bread, and rendering one aseptic, either by adding carbolic acid or boiling, or any other process of the kind. The micro-organic growth which will take place in the impure one will produce a large quantity of acid; the pure one will remain neutral. The most constant source of an acid reaction in the mouth is undoubtedly micro-organic fermentation.

This is not, however, the main subject of to-day's paper, and therefore we shall content ourselves with this passing allusion to it.

We cannot, however, refrain from expressing our gratification at the careful attention this subject has received from the profession, both here, in America, and on the Continent. Professor Mayr has worked out the chemical aspect of the question with great care and exactness; Mr. Tomes has done much in the direction of the effects of organisms in the soft tissues of teeth; Mr. Spence Bate has given us many valuable suggestions in his able and exhaustive summary of dental science at Plymouth last year; Mr. Sewill has thrown out valuable conjectures upon the remote etiology of caries; and Dr. Miller, of Berlin, has done an immense amount of microscopical work, contributing a large array of evidence.

We have not been able until now to present our own views in full, because many of our experiments required a long time to verify and confirm; some afforded perplexing and almost contradictory results, requiring a long time to clear up and involving much repetition, and we may add, in explanation of the apparent delay, that what takes but little time to write or say often requires months and years of disappointment and patience to work out.

In the autumn of 1881 we were only justified in speaking with any amount of positiveness upon one point, namely, the actual presence of micro-organisms in carious dentine. This one fact, and the evidence in support of it, formed the body of the paper we ventured to present to the International Congress. Micro-organisms were found in every fragment of carious dentine of which we cut sections, and we had cut immense numbers; the leptothrix of Leber and Rottenstein was, we found, a superficial growth.

Another fact of scarcely less importance, but one supported by far less evidence, was that the agencies to whose action caries had up till then been attributed by a large majority of scientific opinions, namely, certain acids, were unable to produce any such changes upon teeth exposed to their action alone, although the enamel protection was removed, and the acids employed were those present in the mouth. We had read many allusions to caries produced in teeth out of the mouth by artificial means; we employed the means indicated (whenever they were indicated, which was rarely), with the addition that we did so under absolutely aseptic conditions; we repeated the experiments, and the result of (in some cases) years of exposure was that no change that we could detect took place. Here was a second, but a negative fact.

The third fact obviously required was a positive one; it remained to inoculate dental micro-organisms into the flasks and observe the result. We did so, and the result was change in the exposed dentine, but so slight that we could not succeed in cutting a section; still, at the time of our paper of 1881, we firmly believed this change, when allowed to become intense, would prove to be caries. Of the third fact we felt bound, however, to speak very cautiously, and for the last two and a half years we have employed every means in our power to clear it up—with what result we shall endeavor to make plain to you to-night.

We are anxious that you should keep clearly before you four main issues, upon which all the theory which we suggested to you in 1881 depends.

1. That certain forms of micro-organisms, namely, micrococi, rod-shaped oval bacteria, and short bacilli are invariably present in carious dentine.

2. That these micro-organisms extend into the tissue as far as does the caries.

3. That no agents can be made to produce a change resembling the caries in the absence of such micro-organisms, i. e., under aseptic conditions.

4. That under septic conditions a change can be induced which, although we are not prepared to call caries, does in some particulars resemble it; teeth in which this change has been produced we shall submit to you to-night, and also suggest to you why we hesitate to call it caries.

These four points once established upon reasonable evidence, we shall ask you to consider whether we are not justified in deducing from them the conclusion that micro-organisms play an important part in the production of the disease as we see it and are called upon to treat it, and that their active presence is an absolute essential to its production.

We may add, incidentally, that we never suggested that no other agency assisted in the process, although a recent writer attributes some such absurdity to the advocates of the germ theory. We do not consider ourselves justified in wasting your time over such a digression. The first point to discuss, then, is the constant presence of micro-organisms in carious dentine. Upon this point the evidence submitted to the profession by us in 1881 was very strong. We were then able to state that, since we had succeeded in properly cutting and staining sections, we had always discovered micro-organisms. The appearance was not caused by softening agents, because the teeth were cut fresh and immediately after extraction. The number of sections cut by us between 1879 and 1881 was so great that we were convinced that the phenomenon was constant.

Since then, Mr. Charles Tomes has, we believe, made some investigations which have led him to concur in this constant presence.

Dr. Miller, of Berlin, has cut a very large number of sections of carious dentine, with a result which is completely confirmatory of our assertion that micro-organisms are invariably present. In fact, this point has been confirmed by every careful observer, and may be considered to be completely established.

The second point is one very much more difficult to decide—the more so because statements have been made upon this point which tend very much to confuse the mind of the reader. It has been stated by Dr. Miller, who has written a very large number of papers upon this and kindred subjects during the last two years, that there is a zone of softened dentine of considerable width, not affected with micro-organisms, separating the normal dentine from that which is so infected; and further, that the outline of this area of softened dentine does not correspond with the outline of the area infected with organisms. We have attempted to verify this observation, but we have arrived at the conclusion that if there be any such zone at all we cannot believe it to be of any considerable depth, as we have not succeeded in finding any softened tissue that did not contain micro-organisms. Having regard, however, to Dr. Miller's reputation as a careful and conscientious explorer, we do not desire to attach too much weight to negative evidence; later on we shall suggest some weighty positive evidence on this point. With regard to the outline, we have invariably found the outline of the changed tissue to correspond with that occupied by micro-organisms, and we feel hesitation in doubting this latter statement of Dr. Miller because he claims to be able to compare these outlines with the naked eye, unaided by any instrument. We think that this is too rough a test for objects whose greatest measurement does not exceed the 1-10000 of an inch.

There is no doubt that it is easy to establish a line of demarcation with the aid of a sharp instrument between tissue that you can easily prick and that which is quite hard; this line no doubt corresponds very nearly to the edge of the disease. We have also come to the conclusion that it corresponds very nearly to the edge of the micro-organic invasion; that is, we have cut sections as near as we could to the healthy tissue and found them infected. We do not, however, attach so much weight to this fact as to the following experiment, which we think must be allowed to be absolutely conclusive.

Before we can explain its full weight we must enter into a few details of the method we employ to grow and cultivate special germs. We used to make a meat infusion, boil it, introduce it with antiseptic precautions into aseptic test tubes, and seal the tube with wool. If the fluid remained clear we knew it was pure; if it became turbid within a day or two we knew our precautions had not been complete, and some germs had been introduced accidentally, and the tube was of course useless. If we wished to grow a special germ we rubbed a purified probe against the infected spot, and introduced it into the fluid, replaced the wool cap, and the ensuing turbidity denoted the growth of the germ. The objection to this plan was that the turbidity spread through the entire fluid, and if we had, despite our precautions, introduced any other organisms besides those we specially intended to introduce, they all became inextricably mixed in the ensuing putrefaction. To obviate this, we adopted Koch's plan of adding gelatine, and instead of a pure fluid, making a pure jelly; when this was inoculated in a particular spot the growth was confined to that spot, and if anything else dropped on the surface of the jelly it grew there quite separate. Under these circumstances we noticed that different forms of germs grew in quite different ways—some, for instance, forming a white ball, others a mass of spiculæ, others wavy lines; these pecularities of growth could be easily reproduced in other flasks by a second inoculation, until we find it quite easy to separate each variety and grow it by itself without any extraneous growth to confuse the result. We have brought down some flasks, with growth going on, to show you to-night. Well, we proceeded to inoculate flasks with those deepest portions of softened tissue which formed the most outlying layer of changed dentine, and we found that from these portions a growth of organisms proceeded, proving beyond doubt that organisms were contained in the pieces inoculated. This is not a doubtful experiment; it absolutely demonstrates that the deepest portions of the softened tissue contained organisms, and if there exist any zone of alteration beyond them it is so microscopically narrow that we have not been able to detach a fragment of it.

We do not, however, deny that there is a great probability that the advance guard of micro-organisms may be surrounded, and *to a microscopical extent only*, preceded by a softening, the result of the action of those acids which they themselves produce. We shall be able to show that they do generate acids capable of softening dentine, and therefore we should expect to find this effect slightly in advance of their presence; but this is hypothesis merely. We would further add that the transition from very carious tissue to that which seems quite healthy to the eye and the touch is, in the greater number of cases more, sudden than is generally supposed, and allows but little space for this non-infected zone. To convince oneself of this it is only necessary to split a number of carious teeth and prick the surfaces. One more fact should be borne in mind in this connection, namely, that healthy dentine softened by a weak acid does not look different under the microscope from healthy dentine cut fresh, and it is therefore impossible to detect the softening microscopically; the tubes are not larger, nor are they irregular, as is the case in carious dentine—in fact, the existence of such a softened and uninfected zone separating the infected from the non-infected dentine is a matter so difficult to demonstrate that we do not think much value is to be attached to it.

We now come to the third point, viz., that it is not possible to produce caries, or anything resembling it, by subjecting teeth to the action of acid fluids, in flasks out of the mouth, provided the flasks be kept in a strictly aseptic condition. We do not think this point has ever been disputed, and we feel in position to state that the evidence upon which it rests is incontrovertible; but, before discussing it, and the point that follows it, we think it will not be a waste of time to explain what we mean by a change resembling caries. We mean a change by which the tissue affected is made distinguishable from that which is normal to the naked eye and touch or under the microscope. To the naked eye it must become discolored—we only mean changed in color, and not necessarily brown; the surface loses its polish, or, if moist, the affected part must be separable from the healthy with an instrument; to the touch it must become softer; under the microscope the channels must become dilated at the expense of the matrix. In 1881 we exhibited several flasks in which infusions of meat and saliva containing malic, butyric and other acids had been allowed to act upon exposed dentine for periods varying from one to three years; the teeth were liable to caries because they had suffered already from it; healthy portions were denuded of enamel and partially protected by wax, a certain part being left exposed with no perceptible result whatever. Of course a strong acid, or a large amount of acid, would decalcify the tooth, but this does not resemble carious change.

These experiments were sufficiently numerous and conclusive to warrant us in passing on to the fourth point of this investigation, and this will detain us longer than any of the others, as it is in this direction that we have experienced the greatest difficulty and the most perplexing results.

We were so fully alive to the overwhelming difficulties attending any attempt to reproduce out of the mouth the complicated conditions existing therein, that we should have felt anything but sanguine but for a curious accident that encouraged us to proceed in this direction. We will therefore commence by telling you the particulars of this accident.

At the Congress in August, 1881, we exhibited, among other flasks, a series intended to illustrate the fact that no change resembling caries could be induced upon the surfaces of teeth under aseptic conditions. These flasks all contained an infusion of meat and saliva with malic and butyric acid and teeth susceptible of caries, the surfaces ground down to expose the dentine, part of the exposed surface being protected with wax, so that any loss of substance could be at once detected in the exposed part. Now these flasks, which were labeled i, iii, iv, v, vi, had remained perfectly pure from the time they were put up, June, 1880, till the Congress, August 1881, that is, fourteen months, and no visible change had taken place in the exposed surfaces. In taking them home in a bag flasks i, iv, and v fell down, allowing the fluid to come in contact with the cap covering the flasks; iii vi remained upright.

In the course of a few days, flasks i, iv and v, which had tumbled down, became turbid ; iii and vi remained, of course, pure. By the 5th of December, 1881, iii and vi were to all appearances, as before, unaltered ; but the teeth in i, iv, and v were already discolored brown; moreover, the discolored parts were on the surfaces slightly softened, and although the change was so shallow that we could not obtain a good thin section of it, we could see that the tubes were enlarged and contained a material that stained readily, which, owing to the thickness of the section, we could not, unfortunately, identify. Now, whatever this change was, it was manifestly dependent upon the introduction of organisms ; nothing else was introduced. Fourteen months' immersion in the fluid, when aseptic, failed to change the teeth at all; four months in the same fluid, plus germs, produced a change; the same additional four months, in the sister flasks, produced no change at all. This seemed an important addition to the facts in our possession at the Congress. The next stage was less satisfactory; the change did not seem to progress; do what we would, we could not produce a considerable change. We conceived that this might arise from the fact that several important conditions favorable to the activity of the germs in the mouth were absent in the flask. First, the temperature of the body; second, opportunities for lodgment; third, constant renewal; fourth, unlimited and varied pabulum; we therefore contrived a very elaborate experiment in which we proposed to assemble all these conditions, and as many as we could think of. We erected a large incubator, which we kept continually at the temperature of the human mouth; it was divided into an upper and a lower story, which communicated by an aperture. In the upper story was a small bath with a tiny tap contrived to drip drop by drop through the aperture into a second bath in the chamber below; this again dripped into a receiver, the fluid being thus kept in constant circulation through the middle bath. In this middle bath were placed some teeth set side by side as in nature, the roots being implanted in a block of hippopotamus ivory, and weak points created in the interstitial parts with the burring engine, the size of the burr being kept to test any enlargement of the holes, and some others implanted in wax. The upper bath was then filled with saliva, milk, bread, decaying teeth, meat, etc.; while some fragments of the latter were inserted about the teeth in the middle bath. The lowest receptacle was periodically emptied, while the top one was periodically fed. Without troubling you with more details, we thus contrived to assemble the proper temperature the pabulum movement, and the normal disposition of the teeth. Now six months of this highly unsavory experiment produced scarcely any perceptible change, except that all the tissues became black, the holes drilled in the blocks and in the teeth were the same size, and their edges were not a bit softened. The putridity of the baths was, however, so offensive, that it was with some relief that we decided to abandon this particular experiment. We saw that some great essential condition was absent, and though a longer period might doubtless have produced slight changes, my health and appetite suffered from the constant exposure to all these putrid smells, and we agreed to stop the incubator; but this experiment, though apparently a failure, led us to what we conceive to be the true solution of the difficulty. So far we had decided only that some essential factor had been omitted.

The next experiment we shall describe is a repetition of one described by Dr. Miller, with this extension, that it has been carried out under septic and aseptic conditions. Two 8-oz. bottles were half filled with saliva; to this was added bread in both cases, and in one carbolic acid; into these were introduced fragments of healthy teeth extracted for regulation and split. The saliva was the same—i. e., from the same mouth—and taken at the same time, the bread from the same piece, the teeth were halves of the same tooth;both fluids were neutral. The bottle not containing carbolic acid speedily became the scene of an active growth of micro-organisms, for the greater part micrococci; a thick felt of this growth formed at the surface of the fluid. At the end of three months the surfaces of the teeth in the impure flask had become softened, but not discolored; the surface of those in the pure flask was unaltered, the fluid in the pure flask was neutral, that in the impure one strongly acid.

Thus in the impure flask acids were generated as well as germs, or, as we think seems more rationally to express it, by the germs. The teeth from these fluids are here for your inspection. Lastly, a number of teeth are here for your inspection in which a change has certainly taken place after a long immersion in septic fluids.

It is plain, then, that whereas in the absence of germs no change takes place that could be supposed to be caries, and that in the presence of germs a change does take place, which although it would render our views more cut and dried to call caries, we are bound to confess is a very weak caries if it be caries at all; and, further, remembering that unmistakable caries does affect natural teeth on artificial dentures which have no connection with the vascular system, we are led to inquire whether organisms, that are undoubtedly the prime factors in the production of other diseases, afford us any analogy of a loss of power when placed in strange conditions. The answer to this inquiry is very plain and direct, and completely in the affirmative.

Pastuer, Naegali and other equally reliable authorities, have discovered that special organisms alter their character when grown under unusual conditions. Even though they continue to grow and reproduce their species, their special properties weaken and die out in the unnatural surroundings. Thus, to take a couple of typical instances, Pasteur, by growing bacillus anthracis at a peculiar temperature, "attenuated" the organism to such an extent that he was able to vaccinate animals with it—that is, he rendered this special bacillus, which, in its normal condition, would, if inoculated into an animal, produce anthrax, practically inocuous by changing its surrounding conditions. Again, Naegali has been able so to modify the properties of a lactic acid producing bacterium that it produced an ammoniacal fermentation. Lastly, certain pathogenic bacteria require a special soil in which to grow and a special temperature, otherwise the growth ceases altogether. Moreover, the presence of a number of extraneous organisms does in some cases hinder the active growth of others. A similar difficulty has attended the attempt to grow the organism of gonorrheal ophthalmia, and such instances may be almost indefinitely multiplied; the conclusion is, however, pretty plain, namely, that special organisms require special surroundings to display their special activity, and we are inclined to think that in the case of the micro-organism of caries a living mucous membrane is one of those conditions.

In view of these facts, we feel ourselves justified in claiming to have established as a permanent addition to dental pathology the fact that micro-organisms of a special form do play an important part—nay, more, that they are an essential factor in the production of caries. We think many of these experiments show that these organisms do much of the work—at any rate, as far as the removal of the lime-salts goes—by the aid of an acid which they produce. We feel convinced that the process, to be effective, must be carried on in a living mouth, probably because that is the only situation in which the special germs are really active. Analogy seems to warrant this deduction ; but, before concluding, we wish to impress upon the meeting, and through the meeting upon all who take an interest in the matter, that all we claim for the germs is, that without them and their products the process could not go on at all. The essential element that was not present in our artificial experiments is present in the mouth ; it is possible, and we consider from the analogies quoted above, *probable*, that this important element is the living buccal mucous membrane as a scene of operations, and the constant succession of the proper germs. Enough has, however, been laid before you to induce us to hope that this Society will indorse the statement made by us in the August of 1881, and repeated more fully now, that micro-organisms play an important part in the production of caries, and that the dental pathology of the future must include them among the most powerful factors in the production of this disease.

We have only, in conclusion, to thank you, gentlemen, for your kind attention, and to leave the question in your hands for discussion.—*New England Journal of Dentistry.*

A HOME MADE FOUNTAIN PEN.—Take two ordinary steel pens of the same pattern and insert them in the common holder. The inner pen will be the writing pen. Between this and the outer pen will be held a supply of ink, when they are once dipped into the inkstand, that will last to write several pages of manuscript. It is not necessary that the points of the two pens should be very near together, but if the flow of ink is not rapid enough the points may be brought nearer by a bit of thread or a minute rubber band.—*American Inventor.*

SELECTIONS.

MECHANICAL DENTISTRY.—SUGGESTIONS.

BY THOMAS H. MARTIN.

Read before the Indiana State Dental Association, June, 1883.

In this brief paper I shall attempt nothing more than to offer a few thoughts or suggestions, hoping that they will elicit discussion that will result in our mutual benefit.

Upon this department of dentistry depends the welfare of so many of our patrons that it can not be considered unimportant. To restore the natural expression to the face of the patient, to enable him to articulate words distinctly and masticate his food properly, are objects worthy of the best efforts of the intelligent and consciencious dentist. We take pleasure in contemplating the great advancement that has been made in operative dentistry during the past few years, and we recognize the fact that every natural tooth that can be made to answer the purpose for which it was created should be preserved. But after the faithful and qualified operator has, in certain cases, exhausted his knowledge and skill, he discovers after a few years that some of his finest operations have proved total failures. These failures may have been produced by constitutional disease, by accident or by the carelessness of the patient; but failures will occur, and the unfortunate patients must be supplied with artificial teeth.

Since the organization of this Association many experiments have been tried in methods of constructing artificial dentures. To the dentist as well as the patient some of these experiments have been expensive failures. It is true that the rubber now used for base plates, and also the celluloid, are superior to those in use a few years ago, but it can hardly be truthfully said that the materials now used for plates are superior to those in use twenty-five years ago. During the period mentioned some methods have been generally adopted which are certainly not improvements. One of these is the use of section or block teeth. In the construction of half sets of teeth, and, indeed in all classes of partial sets, better results can be obtained by using single teeth.

Many new compounds for taking impressions of the mouth have been introduced, but, in all cases where it is difficult to secure a close fitting plate, there is nothing so reliable as a plaster impression.

At the meeting of the Association last year, Dr. Driscoll read a paper describing his method of antagonizing full sets of teeth. You will remember that he claimed that by making the lower molars short and the upper ones long, in the occlusion of the jaws the lower plate would be pressed forward and the upper one backward, and thus both would be more firmly held in place. During the past year I have tried this method in a number of cases and have been well pleased with the results. When the teeth are arranged in this manner the lower plate is not so liable to be dragged backward in mastication. Many lower plates are rendered almost useless by the edges being allowed to extend so low that they rest almost entirely upon the soft tissues. Such a plate is thrown out of position by every movement of the tongue and by the muscles brought into action in opening and closing the mouth during mastication, and when speaking. When a full set of teeth is first placed in the mouth and the mouth is closed, the cutting edges of the lower incisors should not touch the upper ones, and should barely come upon a level with them. I can hardly conceive a case like this in which it would be good practice to allow the superior incisors to overlap the inferior, to any considerable extent. If the teeth are allowed to overlap in this manner the plates will be more easily tilted when biting upon the front teeth, and food cannot be so readily taken into the mouth.

Among members of the profession there exists a great diversity of opinions in regard to air chambers. Some construct large chambers, both deep and wide, and some very shallow ones, while others believe no chambers should be made. It is urged that all air chambers become useless after the plate has been worn a short time, that irritation is sometimes produced by an air chamber upon which a plate will ride. In very soft mouths there is but little value in an air chamber, even at the beginning, and in this class of mouths the evil effects mentioned are the most liable to occur. The patient who wears artificial teeth usually finds the first two weeks the most trying time, and it is during this time that he has the least confidence in his plate. If an air chamber will give him more confidence at the beginning, and help him along any, give him the benefit of it. But no very deep chambers should be made, and no sharp borders be permitted to rest upon the membrane of the mouth.

Trans. Ind. State Dental Association, June 1883.

HOW TO MAKE A PERFECT FITTING PLATE.

BY WILL H. STEPHENSON.

Read before the Indiana State Dental Association, June, 1883.

In the course of our professional life it is a good plan to pause now and then to re-examine our accepted methods and see if perchance they may be improved. Mankind are very prone to accept that which is, as being all that is needed. All this looking ahead to discover new fields, new ideas, and new methods is well enough, and leads to progress. For the present we will leave that to others and spend a few moments in examining present methods, as some times real progress is not made because of imperfections in present methods, which must be the foundation upon which future progress will have to be based.

It has been, and is now, the custom to make air chambers in upper plates; the object of which is the better retention of said plates in the mouth. It is evident that the plate is held in position by the pressure of the atmosphere upon one side of it, the air being pressed out from the other side by the exact coaptation of the surface of the plate to the surface of the mouth, the pressure being just in proportion to the superfices of the plate. Now I am utterly at a loss, when I seek for a law of natural philosophy that causes a plate to adhere with greater firmness, when it has an air chamber under it, of even one tenth its superficial area. The natural tendency of such an air chamber must be to reduce the pressure. If the pressure is too great then an air chamber may be of benefit in reducing the pressure. I have, however, never heard any one claim that the pressure would be too great. My observation has been that in soft mouths the cavity becomes entirely filled by the soft tissues—this is caused by the greater pressure upon the surrounding tissues—thus forcing them into the cavity, and producing congestion and inflammation, and thereby becoming an instrument of torture, rather than an aid to the better retention of the plate. Believing them to be of no advantage whatever, I have discarded air chambers entirely, both in hard and soft mouths, and have found my work gives better satisfaction than when I followed the beaten path. I never yet have found a brother practitioner who could give a better reason for their use than that the authorities all recommended them. Try the following experiment:

Take two pieces of smooth glass of equal size, moisten them and press them together, and notice the tenacity with which they adhere to each other. Then grind a cavity in one of them, proportioned to the size of the glass, as the air chamber is to the plate; press them together in the same manner, and see if they adhere with greater tenacity than before. If they do not, then the reason usually given for the use of air chambers is not good. Then let the air chambers be relegated to the museum of things of the past which mark as stepping stones, our progress. During the past seven years I have tried all the various methods of fitting plates that have come to my notice, and as a result of such experimentation have adopted the following method, which at least has given good results in all cases where the patients had teeth which articulated over the whole grinding surface of the molars. If my method affords the same aid to others that it has to me, I shall feel amply repaid for presenting it to you to-day.

We all know that plaster, if used with water alone, will warp more or less, and a misfit of greater or less degree is the result. I have tried various means to avoid warping. I now use one and and a half teaspoonsful of potash alum to the pint of water and use the solution in mixing plaster. I use this solution in all my processes with plaster and find it answers a good purpose. In taking impressions I use plaster as thick as I can work it, and in taking the second impression for the model, I mix it just thin enough to run into and fill perfectly the impressions made in the first cast. I believe the secret of working plaster so as to avoid warping lies in stirring the mixture as little as possible, and using it as stiff as will allow of a clear and perfect impression. After taking the first impression, take a wax-knife or large spoon excavator, and scrape the impression from the maxillary tuberosity on the left, around the alveolar process to the maxillary tuberosity on the right, about the thickness of heavy writing paper. Then scrape over the incisive foramen, along the palate process of superior maxilla and of the palate, to the posterior nasal spine. By feeling in the mouth with the finger you will ascertain the distance to the hard surfaces connected with these parts. All the hard surface must be scraped. The amount of scraping to be done will be determined by the character of the soft tissues. If very soft, scrape the thickness of blotting paper; if hard, the thickness of thin writing paper will be sufficient. Now, place the impression in water, and saturate it, using neither varnish nor oil. Mix a little Spanish brown with your plaster, to change the color, so that you can tell when you cut down to the model. By the difference in color you will find the separation as good as when varnish and oil have been used. As soon as you have your model ready, turn it over and scrape it on both sides of the palate process over the posterior palatine foramen and groove anteriorly about one-half inch and to the edge of the alveolar process. It needs to be scraped so that it will bear hard upon the soft tissues. Some mouths require as much as one tenth of an inch. By means of this scraping your plate will rest hard upon soft tissues and after a few days wearing will bear upon the hard tissues equally, thus preventing the rocking and falling down of the plate. I sometimes scrape the model under the lips and next to the cheeks so that it may press firmly at these points.

In the lower plate, after the impression, I scrape the bottom of the impression, when the teeth have been long extracted, about the thickness of No. 60 tin foil, and after I get my model I scrape the labial, buccal and lingual surfaces about the thickness of thin writing paper. When about to take the bite, I say nothing to the patient of my intentions, but place my wax plates in the mouth and order the mouth closed, and at the same time direct them to perform the act of deglutition; at that instant I press the wax together. After the bite is made and wax removed from the mouth, I have the patient push the chin forward and bite, then draw the chin back and bite again; by doing this, I am enabled to tell, when I get the model in the articulator, whether the bite is correct or not.

By following this plan, I have only had two wrong bites in the past five years. In articulating the teeth, I set them as far under the ridge as possible. If gum teeth will not go under, I substitute plain teeth, and will rather sacrifice the beauty of a joint at the bicuspids and molars, than not have them go under the ridge. The leverage must be overcome, and I know of no better way than to set the teeth under and as near where the natural teeth were as possible, and I consider it far better to use plain teeth as bicuspids and molars than to let the teeth project from the ridge. I use plain teeth with pink rubber for gums, when the patient will consent, and thereby make the teeth more serviceable in masticating food. Gum teeth are well enough in their place, but I would dispense with them entirely if permitted. They remind one of soldiers on dress parade, and cause too great a similarity of expression.

In grinding the teeth on the model, for old people, I grind off the cusps of the bicuspids and molars slightly, and also square the front teeth to make them look as if worn by age. I make them articulate so that the back teeth will strike first and leave a space the thickness of blotting paper between the front teeth. After they are worn a few days you will find them close together, and the front blocks will not be crowded off the plate. I am confident that if you will try this plan, you will be pleased with the results, and your patients will meet you with a smile instead of that careworn and discouraged look so often seen. —*Ibid.*

A VERY LARGE SALIVARY CALCULUS REMOVED FROM A PATIENT.

BY JULIAN J. CHISHOLM, M. D., BALTIMORE, MD.

Salivary calculi are not of very rare occurrence. A tumor under the tongue, on one side of the frænum, a dilated duct from the sub-maxillary gland full of fluid, and called ranula, might contain calcareous deposits. But rarely have we the opportunity of reporting a calculus of such magnitude as the one which I extracted from the mouth of a patient two months since. I herewith append a report of the case:

Mr, W., aged 73, consulted me for a glaucomatous trouble. During the consultation, he desired to know whether his defect of vision could be aggravated by a disease of long standing in the mouth. In inspecting this cavity, I found a large swelling under the tongue, on the right side of the frænum. It was a prominent elevation on the floor of the buccal cavity, extending from the inner face of the chin toward the root of the tongue. Its nature was apparent at a glance, for at the anterior and upper part of this large, round, fleshy mass was an opening one-fourth of an inch in diameter, through which could be seen the exposed surface of a salivary calculus. A probe passed in through this opening entered into a large cyst, the thickened and distended duct of Wharton, which was filled with a solid calcareous mass. With a scissors I slit up the cyst wall, and removed from its bed a very large calculus of brownish white color, which weighed, when thoroughly dried, 159 grains. It was pear-shaped, the stem or contracted part having been moulded in the less dilated part of the salivary duct. The calculus was 1⅜ inches long, ¾ of an inch broad at its largest end, and ⅜ of an inch near its most contracted end.

A thread passed around the stone in its longest diameter measured 3⅜ inches. The circumference at the thickest part was 2¼ inches, and 1¼ inches around its most contracted portion or stem. The surface of the stone was rough. It could be easily cut with a knife, the section showing a laminated structure. A drop of acid upon the surface caused carbonic acid to bubble up, showing that carbonate of lime entered into its composition. Chemical analysis showed that phosphate of lime was the chief constituent. The tumor had annoyed the patient for a long time. Its peculiar nature was not suspected till revealed by ulceration of the sac.—*Jour. of American Medical Association.*

DENTAL SOCIETIES.

THE TWENTIETH ANNUAL MEETING OF THE ILLINOIS STATE DENTAL SOCIETY.

Reported Expressly for the ARCHIVES OF DENTISTRY.

[CONTINUED FROM PAGE 211.]

WEDNESDAY, MAY, 14TH.

The society reconvened in the senate chamber at 9:30 o'clock A. M., and after transacting the usual preliminary business, Dr. D. J. Pollock, of Sterling, and Dr. C. F. Matteson, of Chicago, were elected the executive committee for this year, the third member to be appointed by the president, when the place of meeting was designated. Subsequently Dr. W. C. Martin was named as this member. Dr. G. V. Black, of Jacksonville, offered a resolution providing for the appointment of a committee on dental science and literature, whose duty it shall be to report annually on the first day of the annual meeting, on the progress of science and literature as pertaining to dentistry. Also a committee of three on dental art and inventions—the committees to be appointed by the president. These resolutions were agreed to, and Drs. Stone, of Galesburg, Koch, of Chicago, and Woodward, were designated as the latter committee.

Dr. Crouse offered a resolution, which was adopted, inviting visiting dentists and physicians from other States to participate in the discussions.

The regular order being now called up, Mrs. Dr. Kate C. Moody, of Mendota, read an entertaining essay on "Reflex Pain," which elicited much favorable comment. She was the only lady dentist present who participated in the proceedings. She considered pathological conditions productive of real or true pain, and compared the same with reflex or sympathetic pain. She regarded irritation as a chief cause of real pain and stated that reflex pain was readily experienced in its effect, but its causes could not be easily determined. The relations of sympathetic nerves were frequently established through the existence of pain. Neuralgia, in its various forms, was instanced as productive of a large degree of real pain, and to disordered blood could doubtless be attributed much of the nervous disturbance which might be classed under the head of reflex pain. The essayist urged the cultivation of knowledge of the real causes of pain to the end that the distress thus engendered might be speedily and effectively alleviated.

The discussion of the paper was opened by Dr. T. L. Gilmer, of Quincy, who said he felt highly honored in being associated with this beautiful paper, the reading of which he had listened to with much interest, being diverted therefrom only by the good looks of the fair essayist. In contemplation of the subject, the able presentation of the pathological conditions in respect to pain, he had mentally considered these two queries: 1. What is the extent of the dental profession? and 2. Where or what is the line that separates medical from dental surgery?

For himself, he believed the history of the dental surgeon is coextensive with the medical field. The medico invades our domain and specialty, and we sometimes intrench upon his. It is our office to find out the primary cause of dental nerve operations. The eye and ear are more remote organs to us, perhaps, but we should have a good knowledge of them. In his view, much of the pain that comes under our observation and treatment has its origin in dental irritation. We often look to the roots as the source of pain. When we convince ourselves that roots do not make the trouble, we seek further. After locating the difficulty we seek for the cause.

The speaker cited an interesting case of neuralgia that had come under his professional care. A careful examination of the teeth revealed no evidence of decay, nor was there any marked irritation of the gums, they were somewhat diseased. He treated the gums, which in course of time became more healthy. He probed around to find the cause of the pain. While so engaged the patient nearly jumped from the chair, and he then discovered a small cavity which was highly inflamed. The proper treatment was then clear.

It is thought by some that a sympathetic relation, in respect to pain, between two widely separated organs, is readily established. Doubtless it exists, but to trace it sometimes involves us in doubt. If the bony wall, for instance, is defective, we may tell to a certainty where the trouble lies, but the condition of the nerve centre is a problem that often leaves us in doubt. Hence, we cannot always locate pain. Prescribes quinine in reflex pain.

Dr. Gilmer spoke at considerable length on the nature and treatment of reflex pain, but owing to the inability of reporter to distinctly catch his remarks, the larger portion of them is necessarily omitted.—[Editor.

Dr. A. W. Freeman, of Chicago, had frequently noticed reflex action arising from the dental organs afflicting the pneumogastric nerve, said inflammation was always perplexing when the cause was not apparent. He was also greatly surprised at the workings, at times, of certain remedies. He would cite a case that caused him a good deal of perplexity. The case was that of an apparently sound person, with apparently sound teeth, suffering great pain. On examination he found the teeth were really so loose that with his thumb and finger he could pull them out. Of sympathetic cases this one was the most remarkable he had ever seen. He asked the lady to call again. The pain was traceable to the reproductive organs, influenced especially by first conception. In a couple of months the teeth became firm.

He had a second case, that of difficult dentition. There was diarrœha present with great difficulty in checking the bowels, as there was much irritation of the lower passage. Finally he prescribed laudanum mixed with castor oil. There was chorea, all this time. Pressing hard against the gum, he cut it, and soon the tooth, a canine, made its appearance, and the child recovered. There is often observed, in cases brought for treatment, irritation of the dental organs, and a sort of muscular twitching simulating chorea. He had noticed it in a little grandson of his own, when suffering pain. He had a habit himself of muscular twitching at times.

Dr. Black said he would note one point, and try to be brief. He referred to the close kinship or relation between reflex pain and reflex motion, or motor disturbances, especially of the vaso-motor system. It is generally conceded that neuralgia is the result of deficient blood supply, yet it is singular that we may have neuralgia in persons not anemic. These points do not coincide. I know very well that we understand reflex motion better than we understand reflex pain. I suppose these reflex pains, which are of the order of neuralgias, are brought about through the lack of blood caused by vaso-motor disturbances. The probability is that the pain is due to the condition of the vessels that supply the blood. Local tension may produce local neuralgia. I think, therefore, that it may be stated as a principle that neuralgia is the result of local tension.

The doctor cited the case of a patient unable to maintain an upright position. Careful examination disclosed that the tension was an insufficiency of blood on one side, so an upright position was untenable. The same remedy applicable in neuralgia will apply here; in fact will apply in almost all cases not neuralgic as well as in neuralgia produced by over tension. Absolutely we know nothing about these things. We can only construct our hypothesis to agree with the facts.

Dr. Townsend.—Do you hold that the cause of pain being on one side of the jaw will affect the other?

Dr. Black.—Yes.

Dr. Patrick.—We see by the latitude this discussion has taken, how difficult it is to confine or circumscribe a specialty. "No pent-up Utica contracts your powers."

The movements which are caused in the nerves of special sense, by external agents are numerous; in fact, it is external influence only that excites the organs of special sense to action. It is an ultimate fact in nature that consciousness is the result of stimulated nervous tissue; we know that we smell with our nose and see with our eyes; we cannot smell with our ears or see with our tongues; and yet, the gustatory and auditory nerves are in substance like the optic and the olfactory. This difference in function is evidently in the arrangement of the nerve cells and the disposition of the channels through which external agents have to travel to reach them. We constantly feel in spite of ourselves, for it is impossible for us to avoid having sensation when any object excites a nerve; the sensation is within us, but is dependent on external influences; we receive it, but how? It is evident that there is no connection between the words which I utter and the impression which my words have upon your brain; and how diversely the same words will impress different individuals! Witness the effect produced on the mind and body of an individual surrounded by a gay and happy company, who receives a telegram from the hand of a messenger, the few lines of which convey to him the intelligence that a great calamity has befallen his nearest and dearest friend. The shock throws him into convulsions, his friends endeavor to pacify him, he is completely prostrated, a fever sets in, he is delirious for weeks, but finally recovers; his friends sympathized, but were not afflicted in the same manner, they saw the same characters on the scrap of paper that were seen by their unfortunate friend and the intelligence was conveyed to their minds in precisely the same way. Yet how different the result on the nervous system.

Again, two individuals are engaged in conversation, presently one utters words that jar upon the auditory nerves of the one spoken to, the vibrations pass from the nerves of special sense and seize upon the motor system of nerves, these contract the fibers of the levator muscles and suddenly pass the impulse to the extensors, which extending the arm with great force knocks the speaker down; and what for? simply for agitating a little air; the waves of which, passing to the auditory nerves of the one spoken to, were reflected back to the speaker in the form of a repulsive blow. Why should not this phenomenon be classed as an instance of reflex pain? The property of a nerve cord to receive an impression and conduct it inwards is common to all nerves; but there are certain nerves that not only have the property of receiving and conducting an impulse inwards, but also have the power to return the same impulse outwards; these are ganglionic nerves and are distinguished from all others by nervous knots, composed of gray matter, which knots distinguish them physiologically as central organs, from simple nerves, and endow them with the power of reflex action, whether of pain or pleasure. The reflex power is possessed by the gray matter only, and not by the white substance of the cord. The afferent impulse being converted into an efferent impulse, producing what is called reflex action, is beautifully illustrated in the expansion and contraction of the iris in accommodating itself to the luminous vibrations which produce the sensation of light, when the light passes through the central opening or pupil, and thence through the lens to the retina, where it is received by the nerves of the retina on its concave surface; now, if the light be too strong, the small ganglia connected with the nerves which control the movements of the iris, instantly transmit an efferent impulse, which contracts the pupil and shuts off the light; if, however, the luminous vibrations are not sufficient to produce a strong sensation of light (as in a dark room) the iris expands and the pupil is enlarged by the same process of reflex action. The points of a star-fish are supplied with nerves and ganglia to produce reflex action; touch one of the extended points, and the impulse is carried toward the center to the ganglia controlling the point touched; at once the ganglia returns the impulse to the muscles which, immediately contract, and the point curls up. A similar phenomenon is produced when a frond of the sensitive plant is touched; the frond, however, having no muscles to contract, simply droops. Are those ganglia that we find in plant and animal, that bring about such positive action, endowed with intelligence? or are all these phenomena merely a manifestation of chemical and mechanical energy? When we pass beyond the boundary of physics into the region of metaphysics, we become as men born blind discussing the nature of light.

The speaker exhibited a tooth with an exostosed root, showing an elongation of the root rather than an enlargement of its diameter, adding, that this process had gone on, although the connection of the nervous system with the pulp had long been severed, as was proved by an examination after extraction.

Dr. Reed, of Chicago.—Will Dr. Patrick explain by what process the elongation of that tooth occurred, instead of an enlargement manifesting itself.

Dr. Patrick.—Why, it manifested itself as an elongation instead of an enlargement, not by an elongation of the dentine of the root, but by an exostosis of the root which took place at its apex, causing an elongation; had it taken place at the periphery of the root an enlargement would have been the consequence.

Dr. Sudduth.—Regarding that vest pocket tooth of Dr. Patrick's, I am satisfied that the elongation is more apparent than real. Referring to the cement organ in connection therewith, as persistent, he said that primary cement is normal; the secondary cement or exostosis is pathological and the product of some exciting cause, and may occur at any period as long as the root remains within the walls of the cement organ. The deposit in this case surrounds the root as well as being deposited on its extremity and may occur on any part. Still, it seems clear to me, that the elongation is rather apparent than real.

Dr: Sitherwood.—I am persuaded that reflex pain is often caused by physcological as well as physiological causes. He had used the remedy spoken of and thought it might be safely employed, but in his own practice he used ten to thirty drachms of Jamaica dogwood and found it very efficacious.

Dr. Conrad inquired if visitors were privileged to speak, and being assured in the affirmative, said that, in his view, in discussing reflex pain there was a confusion of terms, and it should be reflex action, not a pathological condition as described by the essayist, but rather physiological.

Dr. Patrick interposed that if a man falls like putty from a second story window and does not cry, he is hurt badly; but if he does cry, there is hope for him.

Dr. Brophy then moved that the subject be passed and Dr. Eames' paper be heard. So ordered.

The Perident The chair will introduce Prof. W. H. Eames, of St. Louis, who will, I am sure, entertain and instruct us with his paper on "The Origin of Defective Tooth Structure, known as Pitted, Furrowed, or Cribiform Enamel." You will give attention.

Dr. Eames, advancing to the rostrum, said that at the last meeting of the society he had the pleasure of presenting a brief introductory paper on defective enamel structure. Within the limits then assigned him, little more than presenting the views of prominent writers, together with some objections that obtained thereto in his mind, could be undertaken. Now he would endeavor to supplement that effort by a more enlarged presentment of his views. The theories of all writers of the present day anent this subject were in substantial accord with the views of writers of perhaps a century earlier. These would seem to be so much regarded as settled facts of our science, that, like the traditions of the Church, it were heresy to attempt to confute them. ("Hear, hear, Dr. Ingersoll). But, notwithstaning, this general acceptance in the profession, he made bold to say that these old theories, whether capable of direct disproof or not, were at least doubtful—there is room to doubt at least. So, while he might not hope to thoroughly solve the phenomena of these various formations and present a solution acceptable beyond question, he at least hoped to be able to illumine some of the darker places in the misty theories of the past.

He would consider, under two general heads, the various forms of defective enamel hitherto classed as rocky, ridged, furrowed, cribiform, pitted and grooved. These formations were generally attributed to one cause—arrested development. For the purposes of this paper he would consider them under these divisions: (1.) Congenital. (2.) Accidental or non-congenital.

Within the limits of the first division (congenital) he would include all those defects popularly supposed to originate during the formative period of the tissue; and under the second division (accidental) those forms originating after the complete development of the tissue. Thus, the first will comprise some of the forms known as rocky or ridged enamel, grooves or fissures in the coronal surface of the bicuspids and molars; while the second division will treat of some forms of grooved or furrowed teeth, not considered in the other, and attributed by Mr. Hutchinson and others to the use of mercury in syphilis, and like causes; while the division will also comprise the same characteristics occurring later in life in the form of grooves at the gingival border of the molars and bicuspids, and usually classed as cases of erosion, abrasion, denudation, atrophy and caries—and these last have, in my judgment, a common origin.

The speaker, who occasionally abandoned his manuscript, for extempore speaking, here vigorously combated the arrest of development theory, and insisted that not to constitutional disturbance, such as measles, eruptive fevers, eclampsia, or syphilis, is the consequent defective enamel structure due, but to a defect in the formative organ which might, in cases of pits, be termed a blight or death of the ameloblast, or, in cases of fissures—a rupture, being the result of a separation of the ameloblastic layer.

Alluding to the authorities in respect to the enamel organ, and the layers or strata, external and internal, he referred at some length to the changes they undergo and their formation. Precisely how the process of amelification took place, whether by direct impregnation of the cell or by exudation was a problem, but it was not essential to know so long as it is admitted that upon the presence of the ameloblasts, is dependent the formation of the enamel. The recent explanation of the phenomena of enamel formation, by Prof. Boedecker, Williams and others, need not, the speaker said, be considered in this connection.

The epithelial cells were liable more than any other class,to retrogressive change, yet none developed more rapidly; so the enamel organ, being made up of this class of cells, is subject to the same change and blight of this organ—a death of one or more of its cells, I should rather say—may be looked for at any time.

Referring to the pit described by Wedl and others—an opening surrounded by enamel rods and the bottom clothed with enamel—the speaker said that : "The change which takes place in the walls of these pits from the action of external agents, acids, bacteria, etc., after the tooth is erupted, would result in the forms figured by Wedl and Magitot, and by them described as being filled with pigment, debris of tooth substance, food, leptothrix and the like. The breaking up of the rods forming the walls, giving the pit the form of a pouch or cul-de-sac may be accounted for in this manner. It may be claimed that this would be but a form of arrested development, especially as this process of amelification is one step in the process of development dependent upon some constitutional distubance, as Wedl, Magitot, Tomes and others assert ? We think not. It is not an arrest, but a death or blight of a cell or cells forming the enamel rods—independent of any systemic or general constitutional disturbance.

He next called attention to the fissures or grooves in the coronal surface of molars and bicuspids and said that they are also attributed to arrested development. But as Dr. Black, of this Society, has clearly shown the defect is manifestly not due to a failure to coalesce, but rather results from rupture of the enamel organ at this point ; a separation of the ameloblastic layer, thus separating the rods and forming a fissure.

The period of development when this rupture takes place, was reviewed in all its phases of progress and especially the change noted by Mr.Tomes and others,from protoplasm to formed material ready to receive the lime salts. While it is true that the deposit of lime salts takes place from certain points, yet the receptacles for the lime envelope the entire crown.

Referring to the fissures most frequently found on teeth having prominent cusps, as a defect in the enamel of the same origin as pits, he described their appearance as seen under the microscope and reaffirmed his position, that no matter what form they assume, or whence their origin or where located,constitutional disturbances play no part in their production.

Of the second class of cases of defective enamel, continued the speaker, the "non-congenital or accidental" as was suggested in my paper of last year), I believe a large number to be due to the abnormal action of the so-called absorption organ.

At the time when some of these defects occur the temporary teeth occupy their sockets in the alveoli; the permanent teeth are inclosed in the follicular wall surrounded by a large crypt which, with the roots of the temporary teeth must be removed to allow them to assume their position in the arch. Nature has provided an agent to do this work. Mr. Tomes designates it as the absorbent organ composed of a peculiar class of cells, resembling the myeloid cells of Kolliker; Wedl designates these cells as osteo or odonto-blasts. We believe them to be simply granulation cells. This organ, whatever it may be, is found in close contact with the tissue about to be removed, whether bone or tooth. Cup-shaped excavations filled with this cellular organ are noticeable in the surfaces being acted upon. The removal of the roots of the temporary teeth and the opening of the crypts for the eruption of the permanent teeth is said to be a physiological process,and yet it is so nearly allied, in all physical characteristics to other processes termed pathological that it is difficult to distinguish between them, so as to be able to say what characteristics mark a physiological and what a pathological process. I am of the opinion that the processes are identical, differing only in the circumstances producing them.

Again, it is stated, that the method employed by nature, for the removal of the temporary teeth is *sui generis*. I must dissent from this view, believing it to be the same process, that she has provided for the removal of other tissues. The removal of the protruding stump of a limb by the granulating cells, after the sloughing off of the soft parts, is identical in form and result, with the removal of the temporary teeth. It is simply a result following one of the phases of inflammation. The result of an excitation in a part, otherwise normal, inducing a prolification of cell growth, which may be progressive or retrogressive in character or both, interchangeably; at one time acting as an absorbing organ, and at another as a builder up of tissue, dependent as is generally supposed on the amount of life force present.

Let us apply this view of the character and action of the so-called absorbent organ to the removal of the roots of the temporary teeth.

The speaker characterized, as a notable fact, that the roots of replanted teeth are frequently removed by a process entirely identical with that governing the removal of the temporary teeth. This removal,he said, occurs in some cases soon after the operation; in other cases several years may elapse before the tooth is lost. Sometimes this work of removal commences at the apex of the root, at other times it will be noticed at the gingival border.

The removal, by nature, of the roots of replanted teeth, is termed a pathological process and yet wherein does it differ from the removal of roots of the temporary teeth,which is recognized as a physiological process? It is undoubtedly one and the same process dependent upon the same causes for its action, and governed and controlled by the same laws. The conditions in the case of a replanted tooth are eminently fitted to induce this change, causing a prolification of cell growth; the circulation in the parts surrounding the root being defective, a low type of inflammation is readily set up and the development of cells of a retrogressive character may reasonably be looked for sooner or later in every case.

There seems to be no foundation for the notion that the re-absorption of these temporary roots may not form proper pabulum for the building up of other tissues, that the absorbed product is necessarily excreted. From accident or decay the temporary teeth frequently loose their pulps, which often results in the formation of alveolar abscess. If such an abscess existed at the time absorption should take place such absorption fails, partially or entirely; the tissue which performs this function is thrown into a pathological state or condition and the secretion of the solution ferment does not take place in the usual manner.

Many of the forms of honeycombed and furrowed teeth (incisors and sixth year molars) closely resemble in general appearance surfaces of hard tissue which have been acted upon by the absorbent organ. Incisors marked by horizontal ridges and furrows are said to have their origin in some constitutional defect causing an arrest of development—in the epithelial structure—the furrows indicating a period of arrest, the ridges a period of development, thus forcing the conclusion that there has been a succession of disturbances equal in number to the markings on the teeth. This can hardly be accepted as true, especially in cases where no constitutional disturbance has been observed. May not much of this marking on the incisors and sixth year molars be due to the action of absorbent cells ?

Is it not possible, emphasized the speaker, that, having performed their work of removing the roots of the temporary teeth and the alveoli, they continue to act and remove the enamel cuticle and dissolve out the lime, from the freshly amelified enamel rod's with which they come into immediate contact at the gingival border? The succession of furrows, I think fully accounted for by assuming that there is a period of growth and a period of rest for the incoming teeth; the cells acting upon the enamel when the tooth is at a period of rest, and forming a groove across the surface. When the period of growth sets in the tooth shoots onward and a portion of unaffected perfect enamel passes beyond the reach of the influence forming a ridge; again a period of rest sets in and the cells act upon the enamel brought into immediate contact and another furrow is formed. Thus any number of furrows and ridges are formed dependent upon the continuance of the abnormal action of these cells.

Dr. Eames here quoted largely from authorities in support of his position.

Drs. Underwood and Milles, of London, claim to have found a form of growth in the mouth which grew directly into the surface of teeth otherwise perfect. Dr. Miller of Berlin seems non-plused by the fact that he finds the softening of dentine in caries always in advance of the organisms. The speaker commenting on this, concluded with the statement that this is exactly what we should expect to find, for if decay is produced by the organism, it must be by the digestive fluid,soluble ferments thrown out by them, or by their waste products. When Dr. Koch was examining the gangrene produced in *mice* by the coco-bacterium of hospital gangrene he found uniformly, that the tissues were destroyed in advance of the bacterium. The bacterium seemed not to touch the living tissue at any time after the work was fairly begun. The tissue was destroyed in advance by the soluble ferment.

Upon the conclusion of Dr. Eames' paper, the reading of which was attentively listened to throughout, the society took a recess until 2 P. M.

AFTERNOON SESSION.

Upon reconvening, the Board of Censors reporting favorably, Drs. Robert Goeble, of Lincoln; R. H. Mace, of Belleville, and E. S. Burress, of Walnut, were elected to active membership, and Dr. Frank W. Dean, of Des Moines, Iowa, as a corresponding member.

The regular order, discussion of Dr. Eames' paper, was then announced, and Dr. Ingersoll, of Keokuk, was invited forward to open the discussion.

DISCUSSION.

Dr. Ingersoll.—Mr. President and gentlemen of the Iowa State Dental Association——

Dr. J. N. Crouse, of Chicago.—Mr. President: I rise to a point of order. The gentleman errs at the very commencement. He is not addressing the Iowa Association. [Laughter.]

Dr. Ingersoll.—Then let me amend by saying, Gentlemen of the Illinois State Dental Society,the best society in the United States. [Laughter and applause.]

Mr. President: I was about saying that the subject presented in the very lucid and able paper by Prof. Eames is too large to be fully covered within the limits of a discussion upon an occasion like this. I can, therefore, only allude to what I consider the more salient and important points in his very able paper.

The imperfect enamel tissue appearing in single spots, pits or wells, in various locations, I am willing to concede are due to congenital causes. His theory is ingenious but cannot, I think, apply to the first molars and bicuspids. But we do agree in this—that the old theory is wrong, and as I proceed, you will see where we disagree.

I am glad in having so efficient a helper in combatting the theory of the past. I am glad that Prof. Eames has had the courage to voice opposition to the books and received authorities of the profession in this matter. And I am quite aware that it is hard to stand up in a body like this, and combat the almost universally accepted theory of suspended development. But this universal acquiescence is not the result of plausibility, for the old theory rests upon the flimsiest evidence. In fact, so far as I know, it stands without a single potent or sound argument in its favor.

I have no idea that either the announcement of the theory of arrested development, made by Bourdet in 1757, or the subsequent general acquiescence in the theory which followed, was based upon a thorough investigation of the subject at the beginning, or upon subsequent observations made for the purpose of testing its accuracy. The authority of the name of Bourdet was sufficient to give it confidence.

Let us turn, seriously if we can, to the consideration of the histological origin and character of this theory, to the end that we may overthrow the old and establish the new theory. Consider some of the corroborative evidence, as it is called, offered in support of the old view. They talk of nails, of nail cells, of the imbricated condition of the surface of hair and of the cow's horns. The nail cells argument is hardly worth noting.

Now of the hair. Some older microscopist than Dr. Black, here, pictured something like this (turning to an illustration of the structure of cat's hair on the black board) and said: Oh, here is a case of suspended or arrested development.

Cats' hair is composed of a series of truncated cones, joined to each other longitudinally. This imbricated, shingled condition is assumed to represent a series of periods of suspended development. It is an unfounded assumption, for this imbricated form is the true structural form of hair.

About forty years ago a writer in New York pointed out the wrinkles and grooves on cow's horns as evidence of the correctness of the old theory. He claimed that the changes in nutrition accompanying the recurrence of the seasons accounted for the existence of the rings. The condensations are caused by the more scanty feeding of the winter season; but in summer, when the animal is fat and sleek, and when the whole body develops symmetrically, the horn again grows to its full size.

If asked how about heifers under three years old not having wrinkles on their horns, the champions of the old theory would say that development was not suspended before the three years were attained. The same writer mentions a goose quill with rings around its barrel. The condensations, he says, indicate suspended nutrition, and the successive rings are caused by irregular feeding. But the nails, hair and horns are only three illustrations of the rich growth of the theory of arrested development. The strongest advance in the historical argument in support of the old theory of congenital disease is found in the oft-repeated statement, "the child's mother told me so." Yet look at the portentous array of diseases to which children are subject in early life, and you will see that it is almost impossible for the child not to have had some of these diseases before attaining the age of five years. So when the mother is asked "Did not the child have such and such a disease at a certain age?" she immediately and truthfully anwers "Yes."

The child may have had measles, whooping-cough, eclampsia, scarlatina, eruptive fever, gastric fever, scald head, or any of a long list of exanthematous diseases to which children are especially liable at the assumed period of age mentioned by the inquirer. And we are told that these markings on the teeth enable one to determine the age when this constitutional disturbance occurred.

The historical argument as to the condition of the child's mouth, in respect to markings on the teeth, reminds me of the late lamented Prof. Tice's predictions in his almanac. As you turned over the pages, you read the prediction "rain in places," on such and such a day, and if he found that anywhere in this great expanse of country there were aerial disturbances on the day fixed, he hailed it as confirming his prediction of "rain in places." [laughter.] How about places where it did not rain, and how about those cases regarding which the mothers say that their children had none of the diseases named at the early period of amelification?

Now what does the dentist say relative to the formation of the pits and grooves of the teeth? If he holds to the accepted theory he must assume that when one groove was formed the child had, say scarlatina, at another time whooping-cough, at another chicken, or possibly, small-pox; next, perhaps eclampsia, and so on to the required number of diseases corresponding with the number of grooves found in the child's teeth. If anything can be found in the whole range of ætiology more ridiculous than this, I should like to have it shown.

If we carefully examine the commonly accepted theory, we shall find that it is based on the hypothesis that, while the enamel is being formed, a line of enamel cells extending horizontally across the labial face of the tooth ceases for a time the process of amelification, and the result of this suspension of function is a well marked line or groove, or irregularly formed pits which come into view when the tooth emerges from the gum. Dr. Eames stated in his paper on the subject, read last year, that enamel is deposited in continuous sheets over the entire cap of dentine.

Now I maintain that the doctrine of alternate vital action is the physiological law of all development.

In 1875 I read a paper before this society on this subject, wherein I insisted that arrested development does not always and necessarily imply constitutional disease, but is in consonance with physiological law. The various parts of the body have their alternating functions—the brain, the intestinal canal and the teeth.

The working out of this law is one of the economies of nature. Observe the development of the buds and the leaves of the tree. The roots have shot out under the ground, then they cease to grow and the leaves take their turn at development. In the case of the peach, the young fruit grows rapidly until it reaches the size of a robin's egg, when comes a period of suspended growth. During this period of apparent rest the life force of the plant is not suspended, but is engaged in the work of developing some other part. At this time the stone, which before was pulpy, becomes hard and stony, and the force of the tree is expended in the development of its seed. Alternate development is, therefore, a physiological law, and arrested growth or tissue impairment is not dependent upon the occurrence of constitutional disease. So also in the formation of the animal body, the brain alternates in development with the cranial walls, the intestinal canal with the abdominal walls, the teeth with the maxilla, the ameloblasts with the odontoblasts. The operations of this law is one of nature's wonderful economies.

I maintain, therefore, the impossibility of uniform development, but I do not deny the possibility of arrest of development by disease. Congenital hernia furnishes an example. In hernia, the development of the walls of the abdomen, owing to some functional defect, did not keep pace with that of the intestines. So also the want of harmony in size between the teeth and the jaws, may be caused by deficient nutrition, or by defective assimilation.

Observations on the development of the different organs of the body, indicate that decided changes are apparent, when these observations are made at intervals of about two months. This circumstance tends to the conclusion that the alternating periods of development and rest occur at similar periods of time.

Consider the disproportion between the teeth and the maxillæ. There is only development enough to allow mastication. At times there may be more development of the teeth and less of the maxillæ, or vice versa.

One point further: Investigators have found it convenient to their purpose to consider in this connection, regular intervals,created by the regularly returning periods of development, or growth of different organs.

Bi-monthly or tri-monthly periods are employed for observation, more generally the latter. It is possible that there is in the male organization some such change as occurs in the female, though possibly it is not marked oftener than once in two months. So there are corresponding periods of the emergence of the teeth; the centrals, the seventh month; lateral, ninth month; molars, the 24th, 26th, 28th, 30th. There is the same bi-monthly advance after cutting.

The most puzzling question involved in the old hypothesis, is how to account for the occurrence of *paralel* grooves, disposed at regular intervals, and sometimes numbering as many as five or six.

The theory that I propose is that these markings do not occur during follicular growth and development,but are the result of chemical action which takes place after the crown of the tooth has penetrated the gum. The groove is formed by chemical erosion of the enamel, and the line of action corresponds with the margin of the gum. This action takes place on the labial and buccal surfaces, and sometimes when conditions are favorable, on the lingual also. This destructive process may be carried on at any stage of the eruption or emergence of the crown and will occur at intervals by reason of the operations of the physiological law which governs both plant and animal development. The law of *alternate* vital action prevails in both kingdoms; that is, active development alternates with suspended or diminished development.

Take the maple as an example in vegetable growth. The leaves open and expand to full size. Then comes a period of rest so far as leaf development is concerned. The tree is busy for a time, in some other direction. After a period of, say two, or three weeks, growth at the top recommences; new shoots and leaves are formed, and the tree is clothed with a fresh garniture of light green leaves.

The bi-monthly emergence of the teeth is in agreement with this view—a pair of new teeth appearing above the gum every two months. Thus the deciduous centrals show themselves at about the seventh month, the laterals at the ninth, etc. The molars also appear successively at twenty-four, twenty-six, twenty-eight and thirty months after birth. The periods of progress in eruption correspond with periods of emergence, and this circumstance favors the view that an erosion of the enamel takes place during the period of suspended emergence of the teeth.

An acrid fluid, capable in its nascent condition of dissolving the lime salts of the enamel, is often found at the margins of the gums which during the stay in the emergence of the tooth forms a groove by erosion. When active emergence is renewed the moving tooth is not liable to be thus affected; but on the return of the cessation of emergence, erosion again takes place and a second groove is the result. The formation of an acrid fluid may be caused by gastritis or general febrile condition, and may or may not be associated with the existence of an exanthematous disease. We need not go beyond an inflammatory state of the mucous membrane of the mouth for our diagnosis.

If such disturbance happens at any time between the ages of five and ten years a horizontal groove would result in the permanent teeth which were being erupted at the time of such disturbance. The period of cessation according to a law of nature is followed by one of rapid progress, when a given line on the enamel would not remain on the margin of the gum long enough to become perceptibly eroded. Whenever the period of arrested emergence coincides with that condition of the mucous tissues, which yields an acrid fluidwhich accumulates at the gum line, a groove is formed by erosion; and the number of grooves agrees with the number of such coincident abnormal periods.

[TO BE CONTINUED.]

SOUTHERN DENTAL ASSOCIATION.

SIXTEENTH ANNUAL MEETING, HELD AT LEXINGTON, KY., MAY 6, 7, 8 AND 9, 1884.

Reported Expressly for the Archives of Dentistry.

(Continued from Page 220).

Dr. Patrick said that in the mixed European races more and greater anomalies are found in individual parts than in the races of Africa or Asia. The peculiarity of the human being is that he crosses with his kind. Man forms but one genus, and that genus is the only one of its order, but is divided into many species. He is not only a *genus homo*, but he is homogeneous. In the herbivorous classes of animals we find special families, for the reason that they will not cross. If they do they produce *hybrids*. So there are natural reasons for the irregularities in human teeth, because the races cross and re-cross.

The President called the attention of the association to the Coffin methods, not used so much on this side the Atlantic as in Europe, where he had seen numerous models. It is simply the appliance of a split plate to the roof of the mouth, to spread it, no matter how contracted. You sometimes find an arch no wider than your finger. Put in a split plate, and it will change the whole shape of the mouth, and the shape of the face. Other appliances may be used with the split plate. Dr. Coffin was using the plate very much. He had models where the arch had spread over half an inch, giving an entirely different expression to the face. Nothing can be found to act with so little pain. You can put this plate into a child's mouth, which you are regulating (and you know how hard it is to keep anything in a child's mouth), and it is never troubled. It is kept up by fitting every tooth; so that the arch has nothing to interfere with it. The teeth are enclosed with a rubber plate. You can make a combination of this plate with this wire (Patrick's) in regulating teeth. Dr. Coffin has been very successful with the split plate.

He (Dr. McKellops) tried it on his own son, going back to London to have the boy operated upon. On shipboard the lad was very sick, and would take the plate out and put it back. By the time they landed the displaced lateral incisor was in its proper place. In nine days the tooth was moved, and is there to this day.

As soon it got over the under tooth it remained there—it had to stay put.

Dr. J. Hooper, Louisville, said he had some twenty-five cases, and has had remarkable success. In the case of one lady patient he expanded the arch nearly an inch. She is a muscian in a church, and when she went to sing she took the plate out, and put it back again when she was done. Another was the case of a crossed canine tooth, which was pushed in place in seven weeks. There is no pain except just a little soreness the first four or five days.

The President said Dr. Coffin was of the same opinion as Dr. Patrick, that appliances can be put on at all ages. He does not hesitate to put them on a person fifty years old.

Dr. Patrick described a case of irregularity, from the model, caused by supernumerary teeth. There were two supernumerary teeth between the right superior central incisor and the right lateral, one external and the other internal to the arch. The canine had developed, and cut the gum away up above, and was crowded out and protruded over the jaw. He explained his operations, extending over a period of two years, and how he finally got the central incisor straight but lost the canine, which he believed he could have got into place had he not been in such a hurry in extracting. Some cases cannot be well regulated, when the irregularity arises in the form of the maxillary bones. He had models in which there are only the two front incisors; another with only the lateral incisors; and others have no incisors at all, and in two of them is hare lip. The maxillary bone shows retarded development. That may be so developed as that the front incisors will be too short to occlude with the others. He did not see any means of regulating such cases without taking out the molars, when the bicuspids would antagonize. Arrested development may be on one side or the other, superior or inferior, on the right or left, or in the center. When the lower teeth project over the upper, if these teeth in front show a puffy border, the roots are not right, and if you attempt to move them you will move them out entirely.

Prof. R. B. Winder questioned the influence of the crossing of races as laid down by Dr. Patrick. He had studied the large collection of Indian skulls at Washington, and in every case they are the skulls of the white man, and not of the Indian. The theory is supported by skin developments. Take the most common hybrid, the mule. The characteristics depend entirely on the side of the sire.

These skulls, however, in all cases showed the teeth of the white man, and not of the Indian squaw.

Dr. Patrick declared that the white man who associates with the Indian is close to the Indian. (Laughter). He had never been able to find marks of distinction between a white man's tooth, taking him as a white man, and that of an Indian or negro. He could take an Australian's tooth and tell it, if it were mixed in a bushel; but he couldn't take a European's tooth and tell to what race he belonged. He had tried to, but there is such a variety in the teeth of Europeans that he could not tell.

Prof. Winder remarked that he was speaking of the arches and their arrangement.

Dr. Patrick insisted that there is such a variety in the European that one can't tell. You can hardly tell in the skulls. Samuel George Morton, of Philadelphia, had tried, but could not establish a rule. M. Paul Broca, of France, could not do it. He (Dr. Patrick) had examined these collections at Washington. What astonished him was that a member of the American Dental Association had said there was not among dentists one qualified to examine crania. If they had been in the least acquainted with anthropology, they never would have said it. It is a very difficult matter to distinguish skulls of different races. Take them together, and you will find a European skull that will match any one of them. You do not know the teeth of man until you have studied the teeth of other animals. There was never any anatomy until comparative anatomy became a study, through the influence of Cuvier.

At the close of the session, Dr. A. O. Rawls was presented with a pair of beaten silver drinking-cups, a knife and a masher—a gift from the President. The presentation speech was made by Dr. Patrick, and Dr. Rawls appropriately responded.

SECOND DAY—MORNING SESSION.

After routine the President again called up the subject of

OPERATIVE DENTISTRY.

Prof. Taft, of Cincinnati, spoke with special reference to the time when interference should be made in treating irregularities. In many instances it is made too early. Interference should be mild before the teeth have completely developed. He thought it likely that the rule given by Dr. Patrick was as reliable as anything—to wait till the indentations or cusps on the points of the incisors are worn away. There will be calcification and formation of the roots by that time. It is well not to interfere with the permanent teeth before the age of fourteen or fifteen. They may be moved after that till fifty. Differences will be found in different cases. Sometimes a tooth can be moved easily, and with very little irritation; and the operation must be conducted with very great caution, lest permanent injury be done to the parts. When a tooth is moved to one side a filling up on the other side must take place if you want a fixed tooth. It is a question whether this new growth in the filled place is more susceptible to disease than is the other side. He had sometimes thought a tooth after being disturbed more liable to disease. Where an expansion of the arch is required, a split plate is best. The pressure is against the arch, and the teeth more nearly retain their original position. The appliance used by Dr. Patrick was very good, but the Coffin plate had more sweep of appliance. These two seemed to embrace all that was necessary. It would be well for the profession to thoroughly understand these two appliances, and there would be very little call for anything else. That it is very easy, usually, to regulate teeth, is another reason why it should not be attempted at a very early age. An intelligent parent can correct a child's tooth by very little manipulation. He had known young people correct the position of teeth for themselves. It was better for the dentist to direct the correction than to make a rapid change. The time given ordinarily to the correction of irregularities will yield a far larger income to the dentist in other work; and if the patients can do the work it is better they should do it. A dentist will often spend five or six months regulating a tooth, and only get forty or fifty dollars. It is one of the least remunerative parts of the practice. If the cases can be managed without this waste of time it is far better they should be.

Dr. S. S. Waters, of Baltimore, produced a model in which all the front teeth upper and lower projected forward and were elongated to a most unnatural degree, and asked what could bedone in the case.

Prof. Taft thought it could be very much improved by pressing the teeth up a little and throwing the roots out a little.

The President asked if the molars could not be elongated.

Prof. Taft said it might be done, but thought it as easy to do the other. He would trim the corners of the teeth.

Dr. Patrick said the alveolar processes had moved forward, the septa and cells all being moved. To be successful the operator would have to move the bicuspids back one by one, and hold them there as they were moved. In the meantime further progress forward might be stayed, as it would increase with age. The deformity has been partly produced by a fault in the maxillary bone—the anchylosis of a suture or the non-anchylosis of another suture, as seen in the different shapes of the head. Teeth which depend on the anchylosis of bones follow the bones. The molars were not moved. Anchoring to the molars the others could be drawn back one at a time, and when got back bound there. That would prevent them shifting forward. They would be longer. The back ones would have to be drawn up, or the others, would be too long. When a tooth is shifted to the place required, stop it, and retain it in place till a callous is formed. One might start to move these teeth and the condition of the patient be such that no callous would form. Such teeth can be brought in. If let remain they would get worse; not only the incisors, but the bicuspids.

Dr. Waters, in answer to a question, stated that he had not decided what to do in the case. He merely had it under consideration. The guardian of the patient had almost decided what should be done.

The President and others favored pulling all the front teeth out.

[TO BE CONTINUED.]

GEORGIA STATE DENTAL SOCIETY.

[CONCLUDED.]

Dr. Coyle read a very interesting paper on the physiology of anæsthesia and the best methods of resuscitation. He described the effects of anæsthetics on the blood, rendering the blood corpuscles incapable of discharging their usual function of supplying oxygen and of eliminating the carbonized products of tissue metamorphosis. Narcosis, he says, is simply deprivation of oxygen. Anæsthesia is produced by interrupting the nutrition of the nerve centres. Experimentors are now looking to the mixture of oxygen with anæsthetic agents. Advises the administration of a stimulant (whisky or brandy) previous to administering chloroform.

Recommends ethyl bromide for minor operations. No stimulant required when this agent is employed.

Dr. Winkler had found ethyl-bromide exciting; patients became frightened under its influence.

Dr. Wardlaw read a paper on the chemistry of dental decay, favoring the acid theory, holding that particular acids produced particular varieties of decay.

Dr. E. Parsons, of Savannah, now about 78 years of age and still in practice, read a paper on Progress in Scientific and Artistic Dentistry, comparing the primitive methods of 49 years ago, when he commenced practice, with those prevailing at the present time.

Dr. R. W. Thornton read a paper on Dental Literature, sketching its history from the earliest records. He regarded dental journals as the most important element in the literature of the profession.

The circular letter inviting the appointment of delegates to a meeting for the organization of a National Society was read, and Drs. Catching, Winkler, Wardlaw, Parsons, Carpenter, and Bouton were chosen as delegates.

The meeting was regarded as the most interesting and useful the Society has ever held.

OBSCURING GLASS.—There are many ways of accomplishing this, some of the plans making the glass permanently frosted, others only temporarily so. For permanence, take a flat piece of marble, dip it into glass-cutter's sharp sand, moistened with water, rub over the glass, dipping frequently in sand and water. If the frosting is required very fine, finish off with emery and water. As a temporary frosting for windows, mix together a strong, hot solution of Epsom salt and a clear solution of gum-arabic; apply warm. Or use a strong solution of sodium sulphate, warm, and, when cool, wash with gum water. Or bathe glass with a lump of glazier's putty carefully and uniformly, until the surface is equally covered. This is an excellent imitation of ground glass, and is not disturbed by rain or damp.—*Scientific American.*

JOURNALISTIC.

"**Reading maketh a full man; conference, a ready man; and writing, an exact man.**"

THE OHIO STATE JOURNAL OF DENTAL SCIENCE for May gives Article III on "Special Influences Encouraging Septic Discharges from Alveolar Dental Tissues" by Frank Brewer, D. D. S., San Francisco. The article is worthy of close study and will give the students an insight into that most delicate of all dental operations, the proper treatment of pulp canals.

Prof. C. M. Wright discusses "Phosphate of Lime and the Teeth." After giving the opinions of a number of the studious members of the profession he says: "Now, for what I have here quoted and for other reasons, I think we are safe in believing that the dental profession accept as plausible and profitable the idea that the *density* of tooth tissues can be increased by proper or special nutrition during the period of early development and during childhood, and that an *excess* of the phosphate of lime in food, or administered in preparations (just as cod-liver oil, for instance, is in pulmonary diseases; or, iron preparations in ænemic conditions) *may* be as beneficial to teeth, as it is believed to be to the osseous system at this period. * * * It is believed that the teeth of females, during gestation and lactation, are deprived of phosphate of lime for the benefit of the bones and teeth of the fœtus or child. * * * I must add that my own empirical (clinical) observations favor the employment of the preparations of the phosphates for *children*. I have tried them for years, in dozens of recorded cases, and must acknowledge that, in some way or another, the result has been as satisfactory as in the administration of any remedy for any disease. Children have behaved as though under the influence of a regularly administered tonic. Pale children have acquired color in their cheeks. Listless children have acquired new energy. Flabby children have acquired firmer muscles, and dental caries has been checked to a degree noticeable to parents as well as to myself. I have not believed that the phosphates were simply taken up and deposited in the teeth, but could not fail to observe *general* beneficial results, though unable to fully account for the *modus operandi*. I have administered it as Dr. Cushing recommends, as syrup of lacto-phosphate of lime, given daily for a month in tablespoonful doses, and discontinued for a month, and so on. I do not know but that a bit of breakfast bacon or a small piece of beefsteak every morning, if agreeable to the taste of the child, might furnish just the right quantity, or just the right excess of ingredients, necessary to produce the beneficial effects noticed from the syrup."

The subject of the prevention of caries of the teeth cannot be discussed too much. I have under my observation young mothers who daily use oatmeal, their teeth have not suffered from child bearing. I have others who do not use oatmeal, and the teeth are decaying rapidly; of course, I have advised the latter class to use oat-meal, and in time may be able to draw some information from the cases.

Dr. A. A. Blount of Geneva, Switzerland, in a letter to Dr. Watts gives a method of repairing a tooth that I have often thought of but have not put in practice. I will give the description in his own words:

"Two years ago I had occasion to make an operation after the following method, since when, I have made several:

A young lady had the misfortune to break the outer cusps of the two bicuspids on the same side, nearly even with the gum, leaving the inner cusps standing with the fillings. To build them up with gold or other material would be rather unsightly. She was unwilling to have pivot teeth, and equally so to wear a plate.

I decided to restore the lost cusps by the following simple method, which has proven entirely satisfactory and serviceable: With an engine burr I ground down a broken cusp to the margin of the gum, and prepared a tooth to receive the filling. I selected an *eye tooth* of proper size and color, and ground it to fit; soldered a strip of platinum about the sixteenth of an inch in width, and the thickness of ordinary note paper to this tooth; bent this strip around the tooth in the mouth as one would a clasp, soldered the ends together, coated the inside of this band thickly with gutta-percha, and the root with the same material to protect it and serve as a firm base for the tooth to rest upon, warmed the tooth and clasp, placed them in position and filled up between; one of them with plastic cement, the other with amalgam.

This method can be applied to molars as well, by using the *thin* molar teeth, and a strong band, clasping a remaining cusp, or screws placed in the root canals, the whole secured by an amalgam or plastic filling."

The New England Journal of Dentistry for May opens with "A History of Dentistry," by George H. Perine, D. D. S., New York, and gives "The Early Practitioners in America." He says that prior to the War of Independence there was but one dentist in the American Colonies, so far as can be learned. Robert Wooflindale was his name, and he came from England and arrived in New York in October, 1776, and divided his time between that city and Philadelphia. The profession are under many obligations to Dr. Perine for his labors in collecting and putting in such good shape "A History of Dentistry." We hope he will give us the history in book form.

DENTAL SERVICE IN PUBLIC SCHOOLS.—The Municipal Council of Paris has arranged to have a periodical inspection of the teeth (as well as the eyes and ears) of the pupils in the public schools. This should be done in all schools. All cities pay out large sums to physicians in their employ, but do not employ a single dentist, he must give his services free.

HENRY POWERS, M. B. Lond, F. R. C. S., has placed the dental and medical professions under obligation for his excellent articles "On the Relations between Dental Lesions and Diseases of the Eye." To make extracts from the article in this number would be almost useless, therefore, we would advise a close study of the papers. Under Editorials we find Criticisms—the first being on sore mouths produced by the wearing of artificial teeth.

The editor does not believe that mercurialism comes from vulcanized plates.

Dr. Haskell does not believe much in the mercurial poisoning, but he thinks the non-conductibility to be the chief producer of the trouble. The editor thinks that the defective smoothness of dental plates has much to do in producing soreness by allowing accumulations between the plate and gums of putrid mucus and irritating secretions. I think the editor is in error when he claims that a simple covering of Robinson's felt foil makes the palatine surface smooth, and thus prevents soreness.

The inventor of Robinson's foil claims that the covering of foil, should always extend to the margin of the plate, so that when the plate is in place the covering of foil is exposed at the margin and acts as a conductor to carry off the heat produced under the plate.

Caulk's Dental Annual, second edition, is at hand. The editor requests the secretaries of dental societies to keep him posted in changes of officers, membership, time and place of meeting, and other matters of interest, so that he can keep the society directory correct; also executive officers of other dental institutions, and to all such he will send a copy of the Annual free. Address L. D. Caulk, D. D. S., Camden, Delaware.

Items of Interest, *May*.—Paper 3 on "Is Inorganic Matter, Used as Food, Assimilated?" by J. F. Sanborn, M. D., Tabor, Iowa. The doctor quotes from a number of authors who give a negative answer to the question.

Prof. A. Gregot's new work on the creation, p. 88. "The most important function of the plant in the economy of nature is, with the aid of the sun's light, to turn inorganic into organic matter, and thus prepare food for the animal. Nothing else in nature does this important work. The animal cannot do it; and starves in the midst of an abundance of the materials needed for building up the body. The plant, therefore, is the indispensable basis of all animal life." p. 91—"The plant is not life, but the bridge between matter and life —the link between the two ages." Dr. J. F. Sanborn as a temperance lecturer, is said to be interesting, instructive and amusing.

"Successful Transplanting" is the title used in describing a case of replantation and the writer says after four months the tooth is firmly imbedded and the gums in a healthy condition. The dentist need not be surprised, if within a year he should find the roots cut off by some enemy—perhaps a cut-worm. This is the worst drawback in replanting, and still more likely to occur in transplanting. I am reminded of a case of transplanting. A young man—dude no doubt—called with a young friend on some young ladies. After being introduced, he remarked that he was very glad to meet Miss——, as a part of him belonged to her, originally, and went on to relate that a biscupid which had been removed from the lady's mouth to make room, had been planted in his mouth to replace one lost by caries.

EXPOSED PULP, by Dr. L. C. Ingersoll. He says: "When, then, I am asked concerning the treatment of exposed pulp, the question is not an intelligent one, and cannot receive an intelligent answer without a thorough diagnosis of the diseased condition of the pulp which shall determine whether it is in a state of irritation, hypertrophy, tumefaction or emasculation." * * * "Diagnosis of every case of pulp disease with reference to treatment should be made in full recognition of the following facts:

1. The pulp in its most healthful physiological state tends to obliteration.

2. The vitality of the pulp is so feebly maintained in mature teeth that the slightest causes often produce death.

3. When diseased, the natural tendency of the pulp to extinction is greatly enhanced."

Dr. T. W. Brophy says: "The great work to be accomplished by our profession is to prevent, if possible, caries of the teeth. If, however, we fail in this, our next duty is to arrest it. This, in my opinion, can only be accomplished by the aid of a knowledge of chemistry and therapeutics, a complete control of the patient, thus enabling the practitioner to prevent or correct a contracted arch and crowded teeth, a strict observance of the laws of hygiene and last, but not least, the careful, trained and skillful hand of an honest, conscientious dentist.

So far as we succeed in preventing and arresting caries of teeth, just so far we shall be instrumental in doing the greatest service within our power to humanity."

Dr. C. S. Stockton says: "*Bad teeth*, with the attendant imperfect mastication and consequent dyspepsia, give rise to all hopeless views of life and man's destiny. Hope flags, faith departs, the gods forsake the sky, and kind Providence is replaced by a melancholy and mis-shapen chance, thought and feeling die, the tides of life ebb to the lowest, the whole universe seems bound by irrefragible chains of suffering and remorse, the stars shine with a yellowish glare to his gangrened vision, and a settled misanthropy possesses him and taunts him with the unanswerable interrogatory: Is life worthy living ?

Consider how all this mournful record might have been reversed by a proper attention to art.

While happiness may not be the end of life, nor the test of virtue, yet the pursuit of it is noble and engrosses all, and oftener than elsewhere it may be chased down and captured in a dentist's chair. Here beauty is regained, character brought back, the esteem of the public repurchased, hope restored, the throne of the

Deity unveiled, the world clothed in beauty, and the silver lining of the cloud turned outward; pessimism is pushed out by a rejoicing optimism, which believeth all things, hopeth all things.

A tooth root may thus become a root of all evil, and its extraction may operate like the eradication of original sin." H.

EDITORIAL.

There is one dentist in Missouri, doing country practice, who boasts of extracting one hundred and forty teeth in three days, and at another time five hundred in three weeks. We hope there is not another such butcher, neither in Missouri nor in the whole list of states. This is not dentistry. Taking out teeth or roots that are firm and supplying their places with ghastly, shakey crockery, is a blot on America's dental escutcheon, that it will be the aim of the ARCHIVES to eradicate. Throw forceps to the dogs! or the butchers themselves may get slaughtered. M.

In our report of the meeting of the Georgia State Dental Society Dr. Catchings is reported as having cured a case of *cancer* of the maxilla. It should have read *caries* of the maxilla.

In report of meeting of Illinois State Dental Society in Dr. Ingersoll's remarks of pulp treatment read "*dialysed iron*" for "*iodiolyzed* iron" wherever that form of expression occurs. Also in discussion of same subject Dr. Ingersoll is reported as saying he had difficultly in diagnosing the condition of the patient. It should read he had *no* difficulty, etc.

MINNESOTA STATE DENTAL SOCIETY.

The Minnesota State Dental Society will hold its first annual meeting at St. Paul, Minnesota, on July 16th, prox., and continue three days. The dentists of our prosperous northwestern commonwealth, have felicitously chosen vacation time for their first annual meeting. The place selected is easy of access and unusually inviting by reason of its surroundings as well as by the attractions of the city itself. Minnetonka, White Bear, Lake Elmo and the Dallas of the St. Croix are all famed summer resorts that invite visitors from all sections of the country. The programme of the society is an excellent one and comprises essays and discussions by resident members of our profession, and by brethren from other States. The ARCHIVES OF DENTISTRY predicts a large and very interesting meeting at St. Paul.

The Missouri State Dental Association will hold its twentieth anniversary on the 8th of July, prox. at Sweet Springs, Mo. This society has made rapid progress in the last few years. Each successive meeting increasing in interest and usefulness. Sweet Springs is a very quiet place, and for that reason peculiarly suited for meetings of this kind. Outside the premises surrounding the hotel there is little to distract attention from the objects of the meeting.

Clinics will be a prominent feature at this meeting, and under the direction of Supervisor Price, all may be assured they will be well conducted.

We look for a large attendance at the approaching meeting and feel confident that every one who goes will be amply rewarded.

Other editorial matter, Book Notices, etc., omitted in this number for lack of space.

PUBLISHER'S NOTICE.

Some of the subscribers to the Missouri Dental Journal, who have since become patrons of the ARCHIVES OF DENTISTRY, claim that they should be credited, on account of the latter, certain sums of money which they allege they paid the publisher of the former journal. With these unexpired subscriptions to the Missouri Dental Journal the publishers of the ARCHIVES OF DENTISTRY have nothing to do. Their understanding has been that the publisher of the former journal had already refunded, or proposed to refund, any overplus that may have been paid for the same beyond the period of its existence. But of this we have no other knowledge than the statement of the late publisher of the M. D. J. The publishers of the ARCHIVES OF DENTISTRY commenced *de novo* in respect to subscriptions. The paper is sent only to those who ordered it of us. Many of these subscribers we assume to have been patrons also of the Missouri Dental Journal, but our subscription list is, in the main, composed of entirely new patrons. We are, of course, pleased to add to our list any of the old subscribers of our predecessor, but, as we have received no funds whatever on account of any overplus claimed to have been paid the Missouri Dental Journal beyond its life, we cannot be expected to credit such payments on the subscription list of the ARCHIVES OF DENTISTRY.

THE

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A MONTHLY RECORD OF DENTAL SCIENCE AND ART.

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ORIGINAL ARTICLES.

**"Of all the arts in which the wise excel,
Nature's chief masterpiece is writing well."**

SCIENTIFIC METHODS IN PRACTICE.

BY A. H. THOMPSON, D. D. S., TOPEKA, KAS.

Read before the Missouri State Dental Association at Sweet Springs, Mo., July 5, 1884.

The savage barbarian as he views the manifestation of disease in one of his fellow creatures, concludes that the victim's body is possessed by a malicious spirit or demon. The evil spirit is believed to torture the body or some of its parts by the exhibition of physical force, such as pounding, rending, tearing, stabbing, burning with fire, etc., and the phenomena of disease, as fevers etc., are the results of thistorture.

Following the natural suggestions of this belief, the savage reasons that if disease is produced by evil spirits, the thing to do is to exorcise the demons and drive them out; and from his standpoint his philosophy is rational and his treatment correct. His treatment consists of more or less elaborate devices for the exorcising of the demon and his expulsion, consisting of adjuration, ceremonies with physical contortion, dancing, etc., accompanied too often by severe and cruel treatment of the patient by the medical man or sorcerer of the profession of exorcists among savages. These sorcerers are often the only priests and their ceremonies the only religion of the people. The history of exorcism would carry us down through all ages, even to our own day, for we often hear of ignorant people in remote districts, practising rites for the expulsion of demons.

Once relieved of the demon, the cause of the disease, the patient is wisely left to the care of nature, whom savage people rightly judge to be a good and wise nurse. But, unfortunately for the patient, the treatment is often worse than the disease, and but for which he might more frequently recover. If he dies, the demon is victorious, and has accomplished his purpose of killing the man; if he recovers in spite of treatment—like a modern patient—the evil demon has been defeated and driven out, but, like medical men in our own day, the treatment of the savage exorcist often fails because of a wrong diagnosis. His premises proceed from false bases, and his philosophy in consequence falls to the ground, which reminds us painfully of his modern confreres who often make more egregrious blunders than the savage, who reasons from a smaller capital of actual knowledge. With the savage, every thing in nature is due to the willful action of spirits, and all natural phenomena, are either good or bad, as they may be beneficial or harmful to man.

The extent of Fetish worship for the propitiation of spirits, the world over, demonstrates the prevalence of the belief. Fetish consists of ceremonies intended to propitiate evil spirits, secure their good will and induce them to be harmless to the defenceless creature, man. This belief prevails even amongst some civilized people, and, although their performances or ceremonies may be more mild or less vulgar, it has a no less deep hold upon their superstitious regard. Thus, in China, Japan, and other semi-civilized countries, disease is treated by ceremonies and incantations, with the addition of the administration of mysterious and complex compounds, composed of such things as parched lizards, ashes of snakes, cats, dogs and horses hairs, dragons blood, seeds and barks of sacred trees, etc., all supposed to possess supernatural powers and tending toward the exorcism of the torturing demon of disease.

This idea it was, which gave birth to a crude therapeutics in the first beginings of medicine in pre-historic ages, and among people just emerging from barbarism. The ingredients of compounds prepared separately, or perhaps as compounded according to a given formula, possessed the power of exorcism. The formula was shrouded in deepest mystery, and its administration was accompanied by mystic ceremonies.

Sometimes the mysteries of medicine went hand in hand with the myteries of religion, and were not incongruous, indeed, consid ering that, according to the prevailing philosophies they both dealt. with spirits. There were times when the priests were the only physicians and performed the rite of both professions in the temples of the gods. Indeed, Esculapius himself, was deified and madethe patron saint, as he was the founder of a noble profession. Patients were brought to his temple and laid at his altar, where mysterious rites were performed for the cure of disease.

But from the tyranny of mystery, medicine began early to emancipate itself, and assume the garb of a true science. The work commenced among the Homeric Greeks, with whom medicine became in part, at least, a profession, distinct from religion. The treatment of injuries, especially those of the hunt or battle, was upon natural principles, and antedated the scientific use of remedies for the treatment of disease, many centuries. The Homeric heroes were all good surgeons and treated the wounded after their battles.

In the employment of compounds for the mysterious cure of disease, observing men amongst the early philosophers noticed that certain elements in those compounds had certain and regular effects upon the human system. Some, they noted, were cathartic, some diuretic, some narcotic, etc., and that these effects could be produced at will. This discovery was the foundation stone of scientific therapeutics, and in the history of European medicine, led directly up to the Hippocratic period of clinical observation, and laid the foundations of the natural history of diseases and their treatment. Known remedies were used for the cure of diseases and by experimental search, other remedies were added to the list. That was the dawn of empiricism and the beginning of the period which extends down to our own time.

Erasistratus founded the school in Alexandria (280 B. C.) which was called the empiric. They claimed that they based their observations upon the actual phenomena of disease, rejecting anatomy as useless, and disclaiming the utility of inquiring into the causes of things. They based their practice upon experience, to which word they gave a special meaning. Three sources and these only, could experience draw from; observation, history and analogy. These three bases of knowledge are ever known as the "tripod of the empirics." They were entirely unsuccessful in practical matters, especially in surgery, and the use of drugs, and a large part of the routine knowledge which they possessed became traditional in Rome, where the system flourished. Empiricism existed as a special school up to the middle ages in Europe, and its methods have influenced the practice of medicine down to our own time.

We claim, and often seem to believe that we, at least, in this the pedantic XIXth Century—have reached the scientific period—the golden age—the era of the application of exact knowledge in the methods of practice, that we are, in short, *scientific*, As we bask in the supposed dawn of this glorious age, we do not notice the lingering twilight of empiricism, which yet enshrouds us; we think we see the sun, and ignore the shadow of night fleeing away! But as we indulge the hope that this is true, we cannot suppress the doubt that will arise that we are, after all, not as scientific as we could wish or as we assume to be.

We think, with pain, of how little exact knowledge we have, and how little of that we have is applied in a scientific manner in practice. We think of our routine work and of how we repeat the same operation, day after day, with the regularity and thoughtlessness of a machine, and with no consideration of the scientific principles involved. Then we doubt whether we have escaped from the long night of empiricism and the rule of mere experience; whether after all we do not reason alone from effect to cause, and blindly follow the lessons of mere experience without finding out the causes of things. That, we know, is not science, *science* claims to know all things, and bids us apply her knowledge in practice. We must practice from a capital of exact knowledge in order to be scientific, and consider the day of experimentation to be past. We assume to reason from cause to effect, not from effect to cause. We assume the knowledge, and claim the ability of its application. If we wish to produce a certain effect, we search our repertoir and find and apply the cause. That is the scientific method. It assumes the possession of the power, the means, and directs us to acquire the method of application, and the expected effect will follow as certainly as we apply the cause.

The empirical method applies one cause after another until the desired effect is produced. It ignores the knowledge of the parts of the human system with which it has to deal and which science has given it. It ignores a knowledge of the physiology and pathology of those parts and a knowledge even of the remedies to be employed, a variety of knowledge as indispensable to the scientific understanding of disease as it is to its cure. Why, the wild savage does better than that. He has some knowledge of the parts concerned and has a system of physiology, pathology and therapeutics, grossly erroneous, it is true — but which, he knows well and which knowledge he considers essential. The merest sorcerer or exorcist, must have a reputation for knowledge and skill, or he will not be tolerated. Experimentation in the practice of his profession would not be endured. He must be scientific in his way and he is, for he proceeds from what he considers exact knowledge. But denunciation of this obselete school of practice would be superfluous, when all men unite in condemning it, were it not that its methods are yet so persistently followed in practice. In theory it is the science we claim—in practice it is empiricism that we pursue.

We live in a scientific age and scorn the imputation that we are not a scientific profession. The veriest tyro is nothing if not scientific. He does not distinguish between art and science. He performs an operation and calls it science. He does not understand that artistic ability, a trained hand and a trained eye may be present when the knowledge of the materials upon which he works is absent. He can fill a tooth as he can plug a hole in ivory, or wood, or stone, but he can give no explanation or scientific history for the necessity of filling the hole in the tooth. He cannot go back to the A. B. C. of operative dentistry and give the alphabet of the sciences involved, least of all to spell his way laboriously up through the complex special sciences until he can read his story right and give a reason for his works. And there are many such tyros among us. We are, indeed, all tyros and yet we claim to be scientific.

We proclaim that dentistry is an artistic application of scientific knowledge to the treatment of dental diseases; but do we feel quite sure that we are entitled to the claim? Are we positive that we are escaping from the slavery and indorcence of empiricism and routine? Our conscientious replies to these inquiries, are anything but pleasing to our contentment and pride of attainment. We feel that we prefer ease and ignorance to knowledge and activity. But let us for the once, rouse ourselves from this lethargy and indifference to knowledge, and ruthlessly tear the veil from our pride and expose what lies beneath to a critical world, whether it be good or bad!

We know that science stands like a *Recording Angel* over our professional work and without mercy or favor, incribes success or failure over each and every operation coming from our hands; and records us as hypocrites or fools, as we may be dishonest or honest in the ignorant performance of our work.

She insists that even when we are successful, that is it often accident, because we are so pitiably ignorant of her laws. To illustrate, let us bring our Professional Genius into court, place him in the witness box and allow this Spirit of Science to interrogate, to cross-examine him and see what he knows and then give him a fair sentence.

Spirit of Science.—"What is the operation you are performing?"

Professional Genius.—"Filling a carious *cavity* in a tooth to preserve it from destruction by disease?"

"Why not leave it unfilled?"

"Because the disease, caries, would soon cause the loss of the tooth?"

"How do you know filling will preserve it?"

"Because that is the proper treatment and the experience of the profession has demonstrated it to be practicable and successful?"

"That is empiricism, now give a scientific explanation. What do you wish to accomplish by filling the cavity?"

"The elimination of the disease, the cure of the parts affected, and the restoration of the lost portion, and this we accomplish by filling the cavity."

"Exactly, but you do not begin at the scientific end of the problem, you are a routinist; you do a thing because it succeeded before, but you will not work from effect to causè. Now, tell me, What is caries, and what relation does your knowledge of the disease bear to your treatment?"

"Caries is mainly a chemical solution of the lime salts of the enamel and dentine—especially the latter by which the tooth substance is disintegrated and lost. Upon effecting an entrance into the substance of the tooth, it destroys the tissue in the shape of a cavity, a veritable ulcer. The operation of cleansing the cavity and inserting a substance to exclude fluids and putrefying substances, is the theory of treatment and is effective in practice."

"Very good, but is the disease cured by this operation?"

"Yes and no. Yes, because it is stopped from further progress, and the tooth is preserved to usefulness. No, because the lost parts are never in perfect health afterwards."

"Then your science fails you. You have not the knowledge to perform a scientifically perfect operation. But again, suppose your artistic operation fails. Suppose it leaks and decay comences again?

"It must be repeated. But exclusion of moisture is not always necessary. Some materials require it and some do not; some teeth demand water tight fillings and in others they last without it."

"Why this difference?"

"We do not certainly know."

"There your science fails again. Now, tell me, What forces besides the solvents which you say destroy the lime salts of the tooth, assist in the destruction of the tooth in caries?"

"Animal and plant organisms, the products of fermentation and putrefaction, and galvanic disturbances arising from acids and their effects on various substances in and about the cavity."

"What different parts do these different forces play in the phenomena of the disease."

"We cannot dintinguish minutely between their various effects because they are each and all more or less interdependent and mutually supporting and creating."

"Then your science fails you again, and fail you it will at every point, and yet you claim to be a scientific profession. Are not your claims sometimes overrated?"

"Perhaps so; but you must allow that science itself is incomplete and has not furnished us with all the facts."

"That is begging the question. If you are not informed of all the facts in a given case, your science is not a science, for it lacks exactness. Your operation is unscientific, because it is not ideal; it does not cure the disease and restore the parts to perfect health. What defence have you?"

"My defence is that within the limits of our knowledge we *are* scientific; that so far, as we have exact knowledge—and we have indeed some, we are scientific. That you must grant. That far, we work from effect to cause, and employ methods, that are the products of scientic reasoning."

"I grant you that; but you must be more modest in your claims. You must remember and admit that what you *don't* know outweighs what you *do* know. You lack modesty;your claims are greater than your works; you think you have reached the summit,when you are but at the foot of the mount of Science."

And so throughout the ramifiations of every branch of science or practice, the *Spirit of Science* could, by a brief category of questions, bring our egotistical *Professional Genius* to a place where he must needs admit his ignorance and inability to answer further. There is but one application to be made of the lesson here studied, but one inference is to be drawn, *i. e.*, the professional genius of the age assumes too much, and knows too little. He works industriously at the chair and produces results that excite our admiration and praise, but aside from that he does nothing. He has little leisure and less inclination for the midnight aid of study, or the pick and lens of investigation,or the test tube and crucible of experimentation. From the chair he goes to the society meetings or writes for the journals and vaporizes and talks and produces nothing. He does not search for new facts, but tries to work the old ones over, and indolently presents them in a new garb occasionally, in the hope of deceiving the scientific members and astonishing the unscientific. We are wearied with the iteration and reiteration of old established truths, or the combatting of exploded theories, and often feel prone to exclaim, "How long! Oh Lord, How long must thy people suffer?" We feel the need of a new and mighty Elijah in science to rouse the profession from its lethargy and spur it on to producing something better and more worthy of its intelligence. We look over the journalism and society proceedings of the day with their repetitions of antiquated science, the presentation of methods a generation old, the senile vaporings on obsolete principles and theories, and turn from their pages with an irressitable depression of spirits, wondering when the Moses will arise who will lead us out of this Egypt and this house of bondage.

The need of the profession of this age is to *know!*

It is most imperative and important that we better understand *why* we perform our operations. The *how* will follow of itself. Filling a hole in a tooth is an absurdly simple thing to do, a mere mechanical and artistic performance; but there are few, if any in the profession, who can explain all the scientific principles involved, and give their complete scientific history. Proper knowledge of these principles in any of our operations, requires intimate acquaintance with an endless stream of sciences,all having a bearing directly or remotely upon its intelligent performance. We must *know* all these things or we are mere routinists. We must perform our operations from a firm basis of scientific knowledge, and as there are none who have that knowledge in its completeness, it is at once apparent that the need of the profession to-day is thorough and exact scientific culture. The knowledge is the first and main thing, the execution will follow of itself and is a mere matter of manual skill to which any one may attain, as indeed far too many do without any scientific knowledge whatever. And here we are reminded that the art of the profession to-day is much in advance of its science; more so, perhaps, than at any period in its history. Our practice is far ahead of the science of the parts involved in our various operations. The development of artistic and therapeutic ability has been mainly due to empirical methods and owes little to the sciences concerned. This is an humiliating fact to our scientific pride, but it is indisputable. Experimentation rather than scientific reasoning has wrought the wonderful progress of the last generation. We have depended upon our experience more than upon intelligent investigation. We have worked materials and applied medicines until we have reached a high pinacle of practical success, but our science has not kept pace with our growth in artistic ability. Of art and mechanics and therapeutics we have enough and to spare, and we have attained a high skill in their application, so much so that we have outstripped our science in the race.

We hear of little at the associations but art and artistic triumphs, with scarcely any science worthy of the name. We live in an artistic age, and have caught the spirit which values the artisan beyond the mere investigator of nature. The inventor claims the attention and admiration of the public while the simple investigator, who makes inventions possible, is never heard of. Partaking of this spirit our mechanical ability has outrun our scientific attainments, and if we have no new scientific facts added to our stock, the time will soon come when art itself will stagnate because it will have no new knowledge to work upon. The demand of the age is for new scientific facts. We require new discoveries in exact science to carry us forward to new mechanical and therapeutical conquests. We need, and we must have, more knowledge of anatomy and physiology and pathology and auxillary sciences, that we may achieve greater victories and be of more service to mankind.

We look about us for the men who will lead us forth in the revival of science, for which we long, and we do not find them; and yet there is a new spirit abroad struggling for recognition; a little band of investigators has arisen who may be the forerunners of a reformation, a better era of fearless investigation. We have indeed our Boedecker and Miller and Abbott and their peers, who are, we hope, the heralds of a new renaisance, the champions of a new propaganda. We need some reckless peering into nature; some daring questioning of the truth of established theories and principles some irreverent, dare-devil iconoclasm, to attack and terrify cherished opinions and prejudices, to the end that more science may be created and put into practice. Will these men and their disciples, furnish us with new knowledge, or must we still reach forward with our high art and anticipate science? Must we invent new methods to meet new emergencies, or to conquer hitherto unconquered fields, and then wait for a lagging science to come forward and explain the principles which we have discovered by our crude empirical methods? The demand of the age is for exact, unerring science. Will the men arise who can give it to us?

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A GOOD OPENING FOR A YOUNG-MAN.—London *Truth*: A Vienna dentist, who wishes to retire from business, advertises in the *Medteinische Zeitung* for "a young unmarried doctor who would like to succeed to a business of $5,000 a year, and have a very agreeable existence." No money is demanded for the business, and the agreeable existence is to be assured by marriage with the dentist's daughter, a handsome and well educated girl of 17. A knowledge of dentistry is not an immediate requisite, as the advertiser will be pleased to show his son-in-law how to do plugging.

THE dissecting rooms of the city of Paris use between three and four thousand subjects annually.

DENTAL SOCIETIES.

THE TWENTIETH ANNUAL MEETING OF THE ILLINOIS STATE DENTAL SOCIETY.

Reported expressly for the ARCHIVES OF DENTISTRY.

[CONTINUED FROM PAGE 275.]

WEDNESDAY, MAY 14TH.

The very imperfect report of the remarks of Dr. Thomas L. Gilmer of Quincy, on "Reflex Pain," contained in the June number of the *Archives* is here supplemented by an extract from the official report as made for the transactions of the society. That Dr. Gilmer may be correctly reported, and that our readers may not lose the valuable remarks contained in the extract, each constitute a sufficient reason why it should appear at the earliest practicable time.—[Editor.]

Discussion of Dr. Moody's paper on Reflex Pain, opened by Dr. Gilmer: The contemplation of such subjects as these must convince us of the importance of a more general knowledge of the entire human system, and its workings both in health and disease; as the associate pathological conditions accompanying dental and oral irritations are various, sometimes leading us to distant organs for a solution of the difficulty. What is the extent of the dental specialists' field? Where is the dividing line which separates the physician and dentist? are questions which often present themselves to my mind. Are we to trace the nerves supplying the teeth to the Gasserian ganglion and stop? Are we to follow the arteries of the teeth to the carotid, and stop? If so, our field is indeed limited. But I do not believe this is true; I think our territory is co-extensive with the physicians'. He should come to our special field when necessary, and we should, if we may find the way, go into his field, just so far as may be necessary to determine whether the dental disturbance be simply symptomatic or truly idiophatic. If we have sufficient wisdom, we may greatly aid other specialists—this is particularly true of oculists and aurists—in seeking out the exact location of the primary lesion. Irritations in the peripheries of the dental nerves may be reflected along the various distributions of the fifth cranial and its anastomotic branches to the eye, ear, and sometimes to more remote organs. The uterus and other visceral organs are widely separated from the teeth, but the sympathetic system is so intimately connected with the three great divisions of the fifth, that these organs may, at slight irritation, make scapegoats of the teeth, palming off their own disabilities upon them. While I am fully convinced that irritations of distant organs may cause pain in the teeth and in other peripheries of the fifth, still I further believe that the majority of neuralgias and aches of this nerve are caused from truly dental or posterior nasal disturbances.

In looking for the cause of pain located by the patient in the teeth, we must not be in too great hurry to leave our special field; a thorough investigation must first be made in the oral cavity and then, if we conclude there are no diseased conditions in and about the teeth, it is time to investigate beyond, but not until every nook and corner is carefully inspected; as before said, the great majority of pains about the mouth come from some local irritation. It is thought by some that much of the pain supposed to be reflected from the uterus is not a truly reflected pain, but an essential pain, caused by a vaso-motor disturbance, which causes dilatation of the arteries, making pressure upon the nerves in their walls. The calibre of the arteries of the teeth is controlled by the carotid plexus of the sympathetic. This plexus is given off from the superior cervical ganglion; from this point follow the spinal sympathetic down to the hypogastric plexus, and we establish a relationship between the two widely separated organs. The afferent vaso-motor fibres of this system would transmit impressions made upon them by a diseased uterus to the vaso-motor center in the medulla, and by different fibres be returned, in reflex relationship, to the carotid plexus through the superior cervical ganglion. The irritation of a vaso-motor nerve may, at any time, cause a dilatation of arteries by diminished inhibitory nerve power in a correlated area. This being true, a lack of tone in the arteries of the teeth might be caused possibly by a displaced or otherwise diseased uterus, and the pain which we are accustomed to think of as reflected, may not, strictly speaking, be a reflected pain at all. So, also, might we account for the ravages of decay frequently accompanying pregnancy. Any of us might cite case after case of diseases of the teeth affecting the eye and ear; in fact, I have here a tooth which I extracted for a lady with amaurosis, whose sight was speedily restored following the removal of the tooth. She was not aware of any trouble in the tooth whatever. We see these cases and cure them, but which one of us can, to a certainty, explain how this eye was made blind by this exostosed and otherwise diseased tooth. We may be able to designate the road traveled by the irritation, but what is the condition of the cells of the center which became so confused as to be unable to designate the true locality of the lesion. Very much is known of the nervous system, but still much remains hidden from view.

Neuralgias caused by irritations of the peripheries of the fifth cranial, I find, yield readily to the green tinct. gelsemium, in doses of from five to twenty drops, exhibited every two, three or four hours, as the urgency of the case may demand, until pain ceases, or physiological effect is produced. If it be a pain reflected from a distant organ, it seems to be of little value, having its principal effect as a pain obtunder on the fifth cranial nerve. In fever or irritation of the nervous system, with strong tendency to the brain, flushed cheeks, bright eyes, contracted pupils, hot skin, it is the remedy of all remedies. It is not without danger, and should be handled with care, but I imagine where it has proven fatal it was given when it was contra indicated, that is, where there was a blanched countenance, eyes dull, pupils dilated, cool skin or imperfect capillary circulation. It has been condemned by some as a neuralgic remedy, on account of a lack of uniformity. This may be because it has been given indiscriminately to all classes of neuralgias, and I imagine that cases where it was properly administered and failed, were in reflected pains and not in peripheral irritation of the fifth. Quinine seems to be the remedy in reflected pains. There seems to be no doubt but that this drug diminishes reflex action, it is supposed, by a stimulation of the cardiac peripheries of the pneumogastric.

I feel honored to have been selected to open the discussion on this excellent paper, and in conclusion must say, if this be the character of papers which lady dentists can write, give us more lady dentists.

Dr. E. H. McIntosh, of Bloomington, was elected to active membership.

The special order being called up, Dr. Will X. Sudduth, of New

YorkCity, formerly of Bloomington, Ill., read a voluminous and exhaustive paper upon Dental-Embryonal Histoloy. The aim of the essay was to describe the tissues especially relating to dental embryology and the preparation of the same for observation under the microscope together with an interpretation of what such tissues show. The doctor displayed a thorough acquaintance with the forms and structure of the teeth not only as they appear to the naked eye, but as revealed by the microscope, and his research into histological structures had manifestly qualified him to speak with the authority of a thorough acquaintance with the minute anatomy of all the dental tissues. The paper was therefore very attentively listened to, despite its great length.

At the close of the discussion the chair called upon Dr. Harlan, who had been appointed to open the discussion, but that gentleman said the subject had been so thoroughly covered by the essayist that he could add nothing.

Prof. Seymore, of Normal, was called upon, but added that all he could say and more, was comprehended in Dr. Sudduth's paper.

Dr. Black then arose and highly complimented the paper from the standpoint of a microscopist. The histological research and certitude shown by the essayist in his original investigations were very creditable to Dr. Sudduth. Upon only two minor points would he (Black) disagree with him. He was not prepared to admit that the peridental membrane is formed from the remains of the enamel organ.

Dr. Sudduth interposed that he had not said so, and made an explanation from which it appeared that he was in complete accord with Dr. Black upon this point, in affirming that the follicular wall constitutes the peridental membrane.

Dv. Ingersoll.—What is the relative location of the peridental membrane with reference to the other tissues?

Dr. Sudduth explained that it lies between the inter-cartilagenous and the inter-membranous tissues.

Dr. Ingersoll.—This membrane is not recognized in anatomy as in the peridental tissues. Where, then, does it belong? I asked that question in a dental publication and I ask it again now. Both sides to the controversy ignore the question. It ought to be settled by histology. It should be shown to be a part of the dental follicle if it really is.

Dr. Sudduth re-affirmed his position.

Dr. Black.—It is foolish to contravert or deliver lectures on this subject. It belongs to us and to all other men who study histology.

Dr. Sudduth.—If this organ does not lie where it is stated to be located, then we ought to know it; otherwise in operating we might get things mixed.

Dr. Cushing moved to pass the subject. Agreed to.

The regular order was announced—discussion of Dr. Judd's paper on Inflammation.

It was moved to pass the discussion.

The Chair.—I hope this will not prevail. The paper is a very able one, and upon an important subject.

Dr. Crouse.—I hope it will not be passed, but I do not myself feel competent to discuss it. I would like, however, to ask Dr. Judd a quession about dental caries in relation to inflammation.

Dr. Judd.—I stated Dr. Stricker's theory of a return to the original condition, but I said I did not agree with it. In fact, I do not think the theory is indorsed by many scientific men.

Dr. Crouse.—I will ask Prof. Taft, of Cincinnati, whether he agrees with or endorses the process.

Dr. Taft.—The theory is all nonsense. It is impossible to return to that condition, I think. But they use that expression in referring to decaying teeth. Circumstances may modify one's views. I have not been able to get a good idea of the theory for the reason that the champions of it themselves differ in expression.

Dr. Black.—I am glad, Mr. President, that this paper of Dr. Judd's was read—glad that it will appear in our published transactions. That is the place for it. But I do not feel competent to discuss it. Few here are competent to do so, in my judgment.

Dr. Crouse.—I will ask Dr. Black about that theory of Stricker's. I understand he favors it.

Dr. Black.—I will answer like the little boy—"there's nothing in it."

Dr. Spalding asked, if inflammation were not, to a certain extent, dependent upon the condition of the blood vessels.

Dr. Black.—No! I do not think inflammation depends upon the blood vessels. It may be irritation, but not inflammation.

The discussion here closed, at a late hour, and announcement was made that the clinics to-morrow would take the place of the morning session and the society will re-assemble here at 2 P. M.

THURSDAY MORNING CLINICS.

The time was occupied until noon in clinics, which were held in the Ladies' ordinary at the Leland Hotel. The operations were very interesting, and were eagerly observed by the members present.

Dr. J. A. Swasey, of Chicago, illustrated the use of Robinson's metal in conjunction with gold foil. He operated on a lower left inferior molar, which contained a large, complicated cavity. The body of the filling was of Robinson's metal, finishing with gold foil Nos. 4 and 10. The clinic was made for the purpose of showing that the combination of the different materials would form a better filling in teeth with large contours and deep cervical walls, than either material alone.

Dr. Jas. G. Reed, of Chicago, demonstrated the method of filling the root-canals with gutta-percha dissolved in chloroform. His demonstration was shown on a left inferior molar. It was a difficult operation, on account of the difficulty of preventing moisture from entering the cavity, but after a time, the operation was accomplished satisfactorily.

Dr. Conrad, of St. Louis, mounted a porcelain crown on the root of a cuspid. In some particulars the method he followed was an original one.

The operation was performed throughout in an artistic and workman like manner.

Dr. E.Housinger, of Chicago, filled a posterior approximal cavity in a second inferior molar. This was filled with Watts' crystal gold and the operation occupied three hours, and was done in a thorough and very skillful manner. The assembled doctors were loud in their praise.

Dr. H. H. Townsend, of Pontiac, operated on a left superior first biscuspid from which the pulp had been removed.

The root canal was filled with white gutta-percha solution. The cavity was compound, being upon the distal and across the grinding surfaces and was filled with gold. The operation was completed with Williams rolled gold, No. 120. It was a highly creditable piece of work.

Dr. Edgar D. Swain, of Chicago, mounted a gold crown on a first left inferior molar. This tooth was badly broken, the fissure on the inside extending far below the gum. The tooth was perfectly restored in shape and usefulness.

[TO BE CONTINUED.]

MISSOURI STATE DENTAL ASSOCIATION.

TWENTIETH ANNUAL MEETING AT SWEET SPRINGS, COMMENCING TUESDAY, JULY 8, 1884.

Reported expressly for the Archives of Dentistry.

The association was called to order promptly at 10 o'clock by the president, Dr. D. J. McMillen, of Kansas City.

The roll call showed 27 members present out of a total membership of about 75. During the sessions of the association there were present, including ladies, 115, of whom about 100 were practicing dentists.

The minutes of the previous annual meeting were read and approved.

Under the head of Miscellaneous Business, Dr. C. W. Spalding, of St. Louis, asked for information from different sections of the State relative to the enforcement of the statute regulating the practice of dentistry. He stated that in the city of Saint Louis the law was being rigidly enforced. There were a few who failed to register within the time prescribed by the law, and complaint was lodged against them with the proper prosecuting officer, when a few not holding diplomas were allowed to register, notwithstanding the time fixed by law had expired. This ruling, although very liberal, was held to be in agreement with the spirit of the statute.

In conclusion, he stated that the universal testimony of the dentists of other States was, so far as he knew, to the effect that our State had the best law yet enacted regulating dental practice, and that other States, notably New Jersey, were amending their laws to agree with ours.

Dr. C. H. Darby, of St. Joseph, said the law was being enforced in St. Joseph. Several parties had been indicted for non-compliance, and were fined, but were subsequently allowed to register. All such men of course, were bona-fide practitioners in this State at the time of the passage of the law.

Dr. J. D. Patterson spoke for Kansas City, and Drs. Price, Shepard and others reported that the law was enforced in their respective sections. The general tenor of the reports was that the law is enforced throughout the State.

On motion of Dr. J. A. Price, of Weston, the president and secretary were directed to telegraph the compliments and congratulations of the society to the South Carolina State Dental Society now in session in that State.

The secretary read a circular letter signed and indorsed by a number of prominent dentists, calling a meeting, at Washington, D. C., for the purpose of organizing a National Dental Association and inviting this society to send delegates to the meeting.

The matter was referred to a committee consisting of Drs. Bowman, Swop and Conrad.

On motion of Dr. Spalding, amended by Drs. Price, all dentists present, who are members of other dental societies, were invited to take seats and to participate in the proceedings of the society.

Several new members were elected and Dr. Staples, of Texas, and Tibbetts, of Illinois, were elected honorary members.

Secretary read letters from Dr. J. J. R. Patrick, of Belleville, Ills., and Dr. Geo. H. Cushing, of Chicago; also one from Dr. J. S. Bryant, of Marysville, Mo., which was referred to the PublicationCommittee.

A paper by Dr. Ridgeway, of Columbia, Mo.; was referred to Committee on Voluntary Essays, consisting of Drs. Thompson and Patterson.

The President, Dr.Drury J. McMillen, then delivered the annual address. The address was referred to Committee on the President's Address, consisting of Dr. Thompson, Stark of St. Louis and Patterson. At the suggestion of Drs. Thompson the Question Box was restored.

Dr. Geo. A. Bowman, of St. Louis, presented a report of the Publication Committee of 1881, which, after some discussion, was referred to the Executive Committee. The Executive Committee subsequently reported, recommending the payment of the bill for the printing of the transactions, which was ordered by the Society.

On motion of Dr. Conrad it was voted that the explanation and demonstration of clinics be made before the Association, previous to the clinical operations.

The Secretary exhibited a clinical record book which he had prepared.

Dr. A. H. Thompson, of Topeka, Kan., then read his paper on "Scientific Methods in Practice" (see page 289) which was discussed as follows:

DISCUSSION.

By appointment of the Executive Committee the discussion on Dr. Thompson's paper was opened by Dr. C. W. Spalding, of St. Louis. He said: The admirable paper to which we have just listened opens a broad field for discussion, too broad, indeed, to be covered by the brief remarks I shall make at this time. That there is a lack of scientific culture in our profession, especially in this country, is too painfully evident. In this country the artistic or manipulative branch of dentistry has been cultivated to a remarkable degree, and quite largely to the neglect of scientific study. American dentists have acquired wonderful skill in handicraft, so much so as to attract the attention of all civilized countries. But this fact does not indicate that dentistry is not capable of being based, in the main, upon the exact sciences, nor does it by any means show, that by proper culture, American dentists may not carve out for themselves as high a position in scientific attainment as they have already done in manipulative ability.

The course which the development of dentistry has taken in this country, namely, the cultivation of art before science, is beyond question the most advantageous method, both to practitioners and their clientage. To be first able to perform superior operations, and afterwards to examine and unfold the principles upon which they are based, is far preferable to a process of growth the reverse of this. First productive application, and afterwards the laws or principles governing the same. To transpose a maxim of Karslake, "In art, *scimus ut producamus;* in science, *scimus ut sciamus.*

As I have before intimated, dentistry is really founded upon the principles of natural law. Now let us examine for a moment the sciences most nearly related to dental practice.

Chemistry, Metallurgy, Anatomy, Physiology, Therapeutics. A fair knowledge of chemistry, organic and inorganic, is of prime importance to the dentist in his daily practice. There are compositions, decompositions and recompositions constantly taking place involving chemical changes which should be readily intelligible to the dentist. I have time now only to cite a single example, that of disinfection. We are almost daily called upon to disinfect and purify foul and offensive teeth. We know that the application of certain substances removes the odor, and indicates to our sense of smell that the tooth is pure. But it is well that we should understand the laws according to which this change is accomplished. Any substance possessing disinfectant powers or properties, must, to effect such a result, undergo decomposition or change. Some element in the substance used must have a stronger chemical affinity for an elementary component of the odor, than it has for that to which it is already united. The weaker bond is broken by the attractive force of the stronger affinity, and a liberation of the elements of the disinfectant takes place. and a new substance, one or more, is formed by the union of the liberated elements. Allow me to here add that of the disinfectants lately come into use I find mercuric bi-chloride the most efficient. A solution in water of 1 to 1000 parts has proved strong enough to quickly disinfect the worst cases.

Metallurgy is in a certain sense allied to chemistry. The various mechanical mixtures of metals now common in dental practice, as the mixture of gold and tin, of gold and platinum, etc., and the large number of alloys now employed in the manufacture of filling materials, calls for an accurate knowledge of the science of metallurgy by the practitioner as well as the manufacturer. We should know the proportions in which metals will unite to form true alloys, and should also know the reasons therefor.

The importance of a knowledge of anatomy, including minute or microscopic anatomy, needs only to be mentioned to gain assent.

Physiology is a study the value of which is not quite so apparent to one who has given it but little attention. Its importance, however, cannot be over-rated. If we are to comprehend diseases we must first have a clear conception of what constitutes health. If we are not familiar with the normal functions of an organs how are we to comprehend the nature of that disturbance of its functions which constitutes disease? Without a knowledge of physiology we can know but little of pathology, and if our knowledge of either of these is defective we are not as well prepared as we should be to make a correct diagnosis. If our diagnosis is faulty we blunder in our treatment. Hence a correct diagnosis is of the first importance.

The study of therapeutics is becoming more and more important every day. Heretofore this branch has been too limited, too confined. As a general rule our practice runs too much to local treatment and not enough toward the use of internal remedies. If we are called upon to treat an inflamed pulp, for instance, why should we not prescribe similar remedies to those employed in treating inflammation in any other organ?

I have so grown into this method, that local treatment has become less and less and general treatment more and more, until, except in surgical and chemical ways, I have almost laid local remedies aside.

And now, Mr. President, I cannot more fittingly close these remarks than by alluding to what I believe will be the future of medicine. The new medicine, if I may be allowed to use such a term, is to be based, very largely, upon the science of physiology. Hygiene and prophylaxis are to constitute a goodly share of medical practice, and this cannot be successfully done in the absence of a knowledge of that important science which reveals the workings of the animal economy. Pathology is also equally dependent upon this important science. If we trace the history of physiological discovery we shall find that we have but anticipated that of pathology. As soon as the cell theory was established in normal physiology, it was swiftly followed by a cellular pathology, as its logical counterpart; yet the latter could not have preceded the former, for there could be no real science of pathology until there was an established physiology. Celsus long ago asked the question, "How shall we treat a diseased organ of which we literally know nothing?" Disease is a disturbance, a perturbation of some of the normal activities of the living body, but it is unintelligible except so far as it has been enlightened by the revelations of physiology. Let me then commend to you the study of physiology, that so far as a knowledge of this science is requisite to our special practice, we may hold an even trace with the new medicine.

Dr. J. L. Patterson, of Kansas City: "No one more fully appreciates the importance of scientific knowledge than I. It is one of the promising signs of the times that more attention is being given to this. The profession, on account of the fact that its operations are largely mechanical and artistic, get to running in grooves and forgetting the science concerned in their operations. We look upon the completed architectural display, or the beauties of nature with admiration, but how much more our enjoyment if we can know the principles involved in the building of the house and the physiology of nature's beautiful products. Just so will be the dentist's enjoyment and usefulness if he understands the science involved in his work, instead of plodding along and following a copy that has been placed before him by some one else.

In regard to the bichloride of mercury, I would use a stronger solution when I want to disinfect the canal of a tooth than Dr Spalding recommends, say one or two per cent. In this case, however, it must be used with extreme care, and not allowed to touch the soft tissues surrounding the tooth. For local use in the mouth one part in one thousand is used, and one in from two to five thousand parts for a mouth wash. Anything stronger than this will leave a too marked taste in the mouth.

I do not believe that the dentist should give medicines internally for their constitutional effect unless he holds the degree of M. D. I wish every dentist did hold that degree, but until he does he must act in conjunction with the physician. Dentists generally are not capable of writing prescriptions for constitutional use, certainly not unless they are M. D's, and they should not meddle with the physician's work, because we will thus gain their enmity instead of working harmoniously. To any intelligent physician the dentist can describe what constitutional effect is wanted in order to make possible any good from local treatment, and they will both work together without encroaching upon each other for the best good of the patient.

Dr. C. H. Darby, of St. Joseph, has used bi-chloride mer. with great success, and although he is aware that the agent has been used much stronger than the solution mentioned by Dr. Spalding, he thinks the solution named by him sufficiently strong and much more safe.

Dr. Patterson called attention to the probability that a stronger solution would be more effective.

Dr. Spalding insisted that a solution of 1 to 1000 or say
℞ Merc. bi-chlo. - - - - - - gr. 1
Aqua Destil. - - - - - - - ℥ij
which is near enough to those proportions, was effective and at the same time safe.

Dr. Wm. N. Conrad, of St. Louis.—It gave me great pleasure to listen to the paper Dr. Thompson has just read before us, and to hear the discussion opened by one who has so extended a knowledge of dental subjects as Dr. Spalding. It creates a stimulus to make better and more scientific dentists of us all. The main idea advanced by the essayist was that we do almost everything without any definite understanding as to the why or wherefore. An accurate knowledge of more underlying principles, it should be the aim of the practitioner to acquire. Dr. Spalding in opening the discussion has reviewed a large part of the field pretty thoroughly, and emphasized the position taken by Dr. Thompson. The sciences of chemistry and microscopy must ever play an important part in correcting mistaken theories, and giving light where all has been dark before. Medicine is one of the learned professions, while dentistry has yet hardly attained that position. Still the comparison of medical and dental literature from a scientific standpoint, shows nothing to the discredit of dentistry as a profession of students. The germ theory which is occupying so much of the time of medical writers we find treated equally well in our dental journals by dentists, and their writings show as much research as do those of medical writers. Dental journals are the mirrors that reflect our standing and guage our position as a scientific or learned profession. While speaking of chemistry, the Dr.'s illustrations were apt and to the point; taking for example the antiseptics and disinfectants. He gave us much valuable information.

The use of corrosive sublimate as an antiseptic and disinfectant recommended by the Dr. meets my views. As to our present needs the solution of one part in one thousand is sufficiently strong. It is too potent a remedy to be used incautiously. When you have sufficient strength to accomplish your purpose in any remedy why should you use it stronger? Let us always ask ourselves how we obtain such and such a result. Do nothing empirically, where you can get a scientific explanation for what you do. That is the only way to correct the trouble referred to by Dr. Thompson in his valuable paper.

Dr. N. C. Stark, of St. Louis, We should always first be "Sure we are right, then go ahead."

Dr. Hungerford, of Kansas City, asked what is the rational of the action of bi-chlo. merc.

Dr. Thompson.—The chlorine of the bi-chlo. merc. probably combines with the hydrogen of the sulphuretted hydrogen to form muriatic (hydro-chloric) acid.

Dr. Hungerford.—Would not any other agent having free chlorine answer the same purpose?

Dr. Spalding.—We have chlorine only in combination, and free chlorine is only available as the result of the decomposition of the disinfecting agent.

Dr. Thompson.—Is bi-chlo. merc. a true disinfectant?

Dr. Bowman suggested that Mr. Lambert, a chemist, was present and that he be invited to speak on this question.

Mr. Lambert, of St. Louis, stated that bi-chlo. merc. was doubtless the most powerful anti-septic and disinfectant known at this day. This has been demonstrated by Koch. Hence its efficiency.

He spoke of carbolic-acid, and the extensive use that had been made of it of late years. It is now being discarded in certain cases by reason of its toxic properties. Yet there were cases in which carb. ac. as the weaker agent would be preferable to bi-chlo. merc. In his reading he had not noticed bi-chlo. merc. had been called for of greater strength than 1 to 1000.

He spoke of the study of etiology by members of the dental profession, and said that Dr. Miller, of Berlin in dentistry, stands today the equal of Dr. Koch in medicine.

Dr. Spalding.—Carb. acid does not disinfect; at least, but in a slight degree, the same is true of creasote. One of the chief virtues of carb. ac. for dentists use is its active property as a coagulant of albumen.

Dr. Thompson regards carb. ac. as a superior germicide, more reliable in that particular than bi-chlo. merc. Thinks it probable that the mercury set free by the decomposition of bi-chloride destroys germs.

Dr. Patterson again spoke of the employment of internal remedies as advised by Dr. Spalding; he did not approve of this practice by dentists, but thought the advice of a physician should be had. It was not difficult for the dentist to explain to the physician the constitutional effects desirable to be produced when the physician could proceed to prescribe intelligently.

Dr. Spalding responded that medical men, as a rule, were not qualified to treat dental diseases. This could not be expected of them, as their text books were almost silent on this subject, and little or nothing was taught thereon in medical schools.

Dr. Stark said that medical men were not well informed on this subject, as was evidenced by cases that frequently came under the observation of dentists, also by the fact that physicians often take their families from the care of educated dentists and place them in the hands of the cheap quacks.

Dr. Tibbitts, of Quincy, Ill., thinks Dr. Patterson has struck the key-note. Does not think a dentist is competent to prescribe internal remedies.

Dr. Spalding (sotto voice). They should be.

Dr. Stark described a case which came under his observation. He was consulted in a case of alveolar abscess with profuse discharge of pus. Advised immediate extraction. The physician did not think it advisable to act on this advice, and as a result the patient after a lingering illness died of septicæmia.

Dr. McWilliams, of Mexico.—Extracted a tooth and observed nothing unusual. Subsequently the patient complained of pain. A physician was consulted who declared the trouble was caused by the improper extraction of the tooth. Patient was taken to a hospital when it was discovered that a ranula existed which was removed and recovery followed.

Dr. Brown extracted a tooth and pain and soreness continuing he was accused by the attending physician of having fractured the lower jaw. This he denied and an examination revealed the fact that the patient had worn a lower plate *without removal*, for 14 years. Removal of plate and cleansing the mouth was followed by immediate relief.

Dr. Thompson in closing the discussion on his paper said that he did not therein follow out the comparison of the sciences. We have sciences that are exact, such as mathematics, astronomy, microscopic anatomy. etc., and we have sciences that are not exact. For instance, what do we know of physiology? We know the blood circulates, but we don't know how blood corpuscles are formed. We know something of the digestive processes and the absorption of tne elements of nutrition. but we don't know how the tissues are built up. Compared with mathematics. physiology is far from being an exact science. So in dentistry there is so much that still remains undetermined that there is great need for careful and thorough investigation.

[TO BE CONTINUED.]

SOUTHERN DENTAL ASSOCIATION.

SIXTEENTH ANNUAL MEETING, HELD AT LEXINGTON. KY., MAY 6, 7, 8 AND 9, 1884.

Reported Expressly for the ARCHIVES OF DENTISTRY.

(Continued from page 280.)

AMALGAMS.

The President—Stated that Dr. Patrick had a letter from a officer of the Ordnance to the swelling of amalgam in the mouth, instead of its contracting. He proposed it should be read.

Dr. Patrick—Stated that in a paper read in Boston he had taken the ground that amalgams were poor things. In the course of his reading he never could get anything satisfactory as to the nature of amalgams. His experiments were so at variance with his authorities that they were very unsatisfactory. His paper, published by the American Dental Association, cost him a great deal of research. That paper, throughout all the journals, had never received a particle of attention, though he had been particular in sending it to every dental journal in America and Europe. It did not receive even a direct acknowledgment, except in one or two instances. That pamphlet was either full of error, or full of truth. In either case it deserved attention; but the same men who ignored it will talk by the hour about dental education. It had been given him as a reason for this non-attention that the proprietors of most of our journals have too much amalgam to sell. He did not believe it, for he gave these men credit for business capacity, and believed the time would never come when there will be no amalgam used. It is a good democratic material to use, for it brings all dentists on a level. He had noticed that articles on the other side always received attention. He had been consulting a reliable authority on ship-building, railroad construction, etc.; it was the engineer's text-book "Haswell." In it he read that "all amalgams expand," and yet in every advertisement of an amalgam it is warranted not to contract. He wanted to know the reason of expansion, and wrote to a friend at Washington, Lieutenant Kossuth Niles, of the Ordnance Department, whose answer was that he could not find anything on the expansion of amalgams in cooling and mixing, and that he had spoken to Dr. Woodbridge, whose experience was that amalgams expand in cooling and mixing.

In answer to a question as to whether that could not be accounted for in the tendency of amalgams to assume a spherical form, Dr. Patrick said there were so many different kinds of amalgam that it was difficult to tell. He could not answer without some particular amalgam was specified.

Prof. H. A. Smith—(of Cincinnati), supposed amalgams must not be used, and spoke ironically against them.

Dr. How—Knew that if thin glass beads were filled with some amalgams they would be broken by the setting of the amalgam.

Dr. Smith—Supposed that was on account of the particles taking the spherical form, and spoke further of the utility of amalgams.

The President stated that there was a formula in "Haswell" for gold solder, and if dentists would follow it and make their solder from the gold plate they were using, they would have no trouble.

Dr. Patrick—Asserted that an easy flowing solder should never be mixed with any base metal. Jewelers or gold smiths never use any base metal in the solder. Take 20-carat gold and use 18-carat solder. You cannot use solder that will free you from the responsibility of the blow-pipe. He read this formula: gold, 89; silver, 7; copper, 4. He advised that solder never be kept on hand. Prepare the plate first, then make the solder from that gold; but never keep it over. Melt the residue up with the plate, and make fresh solder for the next case.

In answer to a question he said, if 22-carat gold be used in the formula, that will make about 19-carat solder, and you cannot tell it from the gold plate when polished. In filagree-work requiring fine solder, the work is boiled in nitric acid to bring out the color.

Dr. Rehwinkel—Spoke of crowning teeth when a root is broken under the gum. In filling with amalgam that comes to the edge of the gum, the latter is irritated, and one is never sure of the stability of the material at that point. In case the inner or outer cusp is broken, he takes a thin sheet of platinum to form a band. Binding a thin copper band round the root, to reach under the gum, he fits it closely to the stump, fills the open end with plaster-of-Paris and when it has set withdraws it. This gives him a complete impression, and by filling with fused metal the exact model is obtained, over which the platinum band can be fitted. He cuts so that the crown will overlap, thus covering, protecting and strengthening the root and amalgam joint.

The President—Inveighed against the use of ill-smelling copper when platinum will do, and is so much cleaner.

Dr. Rehwinkel—Said copper was more economical, hence its use.

The President—Then called attention to the new German practise of filling teeth—the rotary method. Dr. Rehwinkel had translated an article from the German on the subject, and he would like to hear from him.

Dr. Rehwinkel—Stated that he had no practical experience with the method. Very dry amalgam could be used by its aid. He had not used the instruments for gold. It required a great deal of practice to become expert with the instruments and gain confidence. Langstaff had investigated the method and spoke highly of it, and

Nicolet has adopted it and claims that he can do anything with it. Experiments had been made in filling teeth out of the mouth to find the adaptability of the filling material. A matrix is indispensable, as a bud-shaped condenser is used.

The President said he had got a set of instruments, and had tried them on teeth out of and in the mouth. There was much of good in the rotary method in applying gold to the walls of a cavity. He had not been successful, but could not say whether the secret of success was in the peculiar gold used or the manner of using it.

Dr. How stated that he had been engaged in some experiments but had not finished them. He was of the opinion that the instruments worked better after the gold had entered into their surface.

TRAFFIC IN DENTAL DIPLOMAS.

Dr. F. H. Rehwinkel—(of Chillicothe, Ohio,) referred to the traffic in diplomas, carried on by the Wisconsin Dental College. He recently had a letter from Dr. Peterman, of Frankfort-on-the-Main, stating that this disgraceful business is in full blast again, complaining of the utter indifference of the dental profession, and that no effort is made to stop the dirty commerce. It would be remembered that in the case of the Buchanan College of Pennsylvania, it was left to a member of the press to begin the fight. Dr. Peterman engaged in a seven years war, and he is now ready to take up the gauntlet with the Wisconsin Dental College, and wants the aid of the profession in America. These diplomas are not worth the paper on which they are written. Their issue may be legal, because of the lax laws of that State. Every State should take it up and bring pressure to bear on the State of Wisconsin to have the charter repealed. About two years ago an offer was made to him of a diploma on parchment for twelve dollars, and he felt disposed to resent it. He believed it to be the duty of the profession to knock the traffic on the head. As the Wisconsin College has a legal existence it would be necessary to move, as in the case of Buchanan College, through the legislature of the State. The government of Germany has already taken notice of it, and the matter will probably be made one of diplomatic correspondence, but it would be well to take action to strengthen the hands of the Germans.

The President hoped action would be taken, and called upon Professor Morgan, of Nashville, Tenn., who condemned the manner of issuing low-class diplomas. He did not know how to reach the evil, which is of deep interest to the profession in the eyes of Europe, unless an expression could be drawn forth from the State of Wisconsin. Everybody knew the dirtiness of the case, and that the practice degrades the profession in the United States.

It was on motion, resolved, that a committee of three be appointed to draft resolutions in respect to the matter; and the President appointed Dr. A. O. Rawls, Professor W. H. Morgan, and Dr. B. H. Catching.

[TO BE CONTINUED.]

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Discussion upon Mr. Underwood's Paper on Influence of Micro-Organisms. (See Paper, Page 241.)

Mr. W. J. Milles said he had only a few words to add bearing on the subject of the pure cultivation of micro-organisms. By "pure cultivation" we mean the inoculation of the contents of a purified flask with a special form of micro-organism. The flasks contain solidified blood serum purified after Koch's method by heating it to a certain temperature. Certain precautions are taken, such as purifying the needle by passing it through the flame of a spirit lamp, etc. The cotton-wool cap is then removed from the flasks, and the surface of the fibrine is inoculated with a small portion of carious dentine taken up on the point of a needle. From the point thus inoculated organisms grow, and in some instances we have obtained pure cultivations, that is, we were able to separate the species, and to ascertain that these organisms breed true. For instance, we inoculate a micrococcus into a sterilized flask, and we find that it reproduces the same species; and if we inoculate a series of flasks from this one, we get the same result. By this means we are able to separate certain of these micro-organisms—micrococci, bacteria, and certain spirilli and bacilli.

Having thus separated the organisms, we tried to advance a step further. We hoped to be able to discover the special form of organism which produces caries, but unfortunately with negative results. Having allowed the organisms to grow to a considerable extent in the flask—here is one which you see has become absolutely opaque with organisms—we boiled a healthy tooth for a certain time, and then dropped it into a tube containing some special form of organisms—say, one containing nothing but micrococci—and we left it there for several weeks, and, in some cases, months, exposed to the action of the organisms, maintaining during the time a moderate elevation of temperature, but, as I have said, no change whatever occurred. The probable explanation is that which Mr. Underwood has given, viz., that some of the conditions necessary for the production of caries, which exist in the mouth, were absent from our experiments. I have no further remarks to make at present, but if any one likes to ask any questions later,as to the incubation of these flasks, or any of our other experiments, I shall be very pleased to give any information I can.

The President remarked that micro-organisms seemed to be assuming an important position. not only in dental, but also in general pathology. As regarded the part they played in the production of caries, the inquiry seemed to have a certain fascination about it which he had no doubt had been felt by many of the members present, and he hoped that some of them would favor the meeting with an explanation of their views on this important question.

Mr. Henry Sewill said he must in the first place assure Mr. Arthur Underwood of the high opinion he had of the work which had been done by him and his colleague. He regretted to say that he did not himself belong to the remnant of the society which could lay any claim to a scientific position; but so long as the society possessed a remnant like Mr. Underwood and others,whose names they were all proud of, its reputation would continue high.

He thought that there were strong a *priori* grounds for acquiescing in the correctness of the views which Mr. Underwood had put forth. They explained one or two points which were very clear, viz., why the dentine was more rapidly destroyed than the enamel, owing to the organisms multiplying in the tubes of the dentine. It was evident also that if Mr. Underwood's views were correct, they effectually disposed of all the theories based upon inflammatory processes in the dentine, the existence of vital force, and other hypotheses which he believed to be entirely false and misleading. He had himself long held and affirmed that dental caries consisted essentially of disintegration of the enamel and dentine due entirely to the action of external agents; that the enamel and dentine were perfectly passive during the process and manifested no pathological action, and no so-called vital phenomena. He thought that the truth of this statement was amply proved, first, by the fact that from our knowledge of the anatomy of enamel and dentine it was impossible to conceive that enamel, and scarcely less possible to conceive that dentine could be the seat of anything like pathological action. Secondly, there was the fact that caries might occur in natural teeth inserted in artificial dentures, and even in hippopotamus ivory when worn in the mouth.

The predisposing causes of caries were, first, innate structural defects in the enamel and dentine; secondly, overcrowding and irregularity, which acted by favoring the lodgment of food between the teeth for prolonged periods, and the formation of the products of decomposition; and, lastly, vitiated secretions in the mouth. The exciting cause of caries was acid in some form or other.

The authors of the paper had shown clearly that the disintegration which takes place in a carious cavity could not go on without the presence of organisms, but though it was no doubt important to ascertain the nature of the minute changes which took place in the tissues whilst undergoing disintegration, he did not regard these as of supreme importance. The important point was to disprove the various false views of the nature of caries which had been put forth from time to time. To these Mr. Underwood's investigations had helped to give a finishing blow, though he considered they could be clearly disproved without their aid.

Dr. St. George Elliott said that, being tolerably familiar with the writings of Dr. Miller, he should like to point out the chief discrepancies between the facts therein spoken of, and those which they had heard brought forward that evening. There was, in the first place, the zone of softened uninfected dentine which Dr. Miller described as existing between the part invaded by micro-organisms and the limit of the hard portion of the dentine. He thought this zone had been originally noticed by Mr. Tomes. Mr. Underwood denied its existence, and had been very explicit on that point. To outsiders it became simply a question as to which was right, and probably a few additional observations would decide the point.

Then Dr. Miller stated positively that he could produce artificially under septic conditions, out of the mouth, caries so closely resembling that which occurs in the mouth, that he had submitted a large number of slides, some bearing the artificial and others the natural product, to microscopists in different parts of the world, and defied them to tell the one from the other. Mr. Underwood had said that he repeated these experiments, and had failed to produce caries artificially. Here again came the question, Who was right? A little further experimenting would probably elucidate this matter also.

Again, he said the questions brought before the Society in Mr. Underwood's paper, even though the lines of the paper were strictly adhered to, would require for their full discussion a much greater amount of time than was usually allotted to discussion at the Society's meetings. There was, however, one point referred to by Mr. Underwood which he thought was worthy of comment, if only for the sake of emphasizing and calling attention to it, viz.,the fact that many of these micro-organisms, when cultivated under conditions which they do not like, become stunted, as it were; just as was the case with a plant when grown under unfavorable conditions. And he thought it was very probable indeed that the failure of Messrs. Underwood and Milles' artificial caries experiments was due to this cause, to their being unable to give the micro-organisms just the conditions which suited them. In conversation with Mr. Underwood he had repeatedly told him that he should be extremely surprised if he ever did succeed in producing caries out of the mouth, seeing that the conditions under which it occurred in the mouth were so manifold.—*British Journal of Dental Science.*

[TO BE CONTINUED.]

SELECTIONS.

THE SEPTIC THEORY OF DENTAL CARIES.

BY F. SEARLE, D. D. S., SPRINGFIELD, MASS.

Read before the Conn. Valley Dental Society, June, 1884.

In 1877 Arthur S.Underwood, M. R. C. S., L. D. S., Eng., and W. J. Milles, L. R. C. P. London, F. R. C. and C., undertook "to determine, as far as possible, to what extent germs are present in the dental tissue when in a state of disease, and to deduce conclusions as to the effect of their presence." After four years' patient investigation they published their first report of their progress in a paper read before the International Medical Congress, in which they say:

"We consider that caries is absolutely dependent upon the presence and prolification of organisms. This view we propose to call the 'septic theory.'"

In the examination of this theory, it will be necessary to go over a somewhat extended field of inquiry, and introduce some other theories for examination. Investigators into the phenomena of diseases are liable to seek an explanation in the insufficient evidence of their own discoveries, without taking into account what others have done or are doing in the study of questions bearing directly upon the subject which they are examining. Especially has this been the case with recent investigators of dental caries.

When Underwood and Milles in England were making their investigations in relation to organisms, they seemingly did not take into account the discoveries of Dr. Boedecker, of New York, in relation to the distribution of living matter in bone, dentine, enamel and cementum, or of the observations of Dr. Abbott respecting the evidence of inflammation in diseased fibrils. Dr. Abbott was equally uninformed of what Underwood and Milles were proving in regard to the presence and agency of germs in the fibrils. He saw the evidences of inflammation, but not, as I think, the true irritant. Underwood and Milles saw the irritant, but not the inflammatory appearances of the fibrils, or at least did not take them into account; consequently, they announced their septic theory, and Dr. Abbott his inflammation theory. The reviewer can gather and arrange all the evidences from all sources and thus form an unbroken chain of evidence, composed of demonstrated facts and legitimate deductions from those facts, which will explain more than any theory supported only by incomplete and one-sided observations.

I propose to gather up the important facts which have been reasonably well established, bearing upon the question of caries, separating them from mere opinions, and endeavor to find what they teach.

Our subject is intimately related to questions which have occupied the attention of chemists, for more than two hundred years. It is, infact, one of the latest questions of a large and rapidly increasing number, growing out of those minute yeast granules which Leuwenhoeck discovered in 1680, and which Cagniard-Latour, and Schwann re-discovered in 1836–39, and which were the starting point of that long discussion between Pasteur and Liebig and their respective schools of the true theory of fermentation, which lasted from 1840 to 1870, and which the illustrious Pasteur has completety answered by a series of experiments which, in the language of Milles, are "classed among the most brilliant records in the history of science." "The true ferments are now known to be living organisms that produce fermentation as a function of vital activity." Unlike the soluble ferments, these living organisms increase at the expense of the substance fermented. The true fermentations are purely physiological processess, which are defined by Pasteur as the "direct consequence of the process of nutrition, assimilation and life when they are carried on without the aid of free oxygen, or as a result of life without air." (P. S. M., pp. 225.)

The discoveries of Schwann, Pasteur and others, in regard to the agency of the germs of micro-organisms, laid the foundation upon which Lister, 1865–67, established the germ theory of contagious diseases, and the septic character of some diseases not so contagious. Lister, an eminent French surgeon, had previously exhausted all the resources of the old methods of dealing with septic diseases by efforts to exclude the oxygen of the air from wounds, etc., with unsatisfactory results. The revelations of Pasteur opened his eyes to the fact that his foundation principle was defective, and consequently his methods could not be successful. In 1867 he published the results of his antiseptic (and aseptic) methods which he had been testing for two years, with previously unheard-of success. This brought about the great revolution in general surgery which immediately followed, the principles of which have been generally accepted, and now direct the methods of surgery. Without the discoveries of Pasteur and Lister the germ theory of dental diseases would have been long deferred.

In 1873, Liebig and Rottenstein published their work on Dental Caries and its Causes, which contains much of interest upon the existing theories, especially in relation to the germ theory, which they were the first to put into definite form. But the chemical theory held its ground in spite of their discoveries, because there was no Lister to give clinical demonstration of the correctness of their views. We hear but little more upon the subject except in general allusions to the theory in partial approval, or total dissent, until 1881, when Underwood and Milles published their first paper.

The failure of the chemical theory by acids to explain satisfactorily all the conditions present in caries, led these gentlemen "to seek for the presence of organisms in carious dentine with results that far exceeded their expectations."

Their first paper contains the following conclusions:

1. "We consider that caries is absolutely dependent upon the presence and prolification of organisms; that these organisms attack first the organic material and, feeding upon it, create an acid which removes the lime-salts." . . . .

2. "That suppuration of the pulp and its sequences, such as alveolar abscess, depend also upon the successful working of organisms."

In their second paper they say: "We are anxious that you should keep clearly before you four main issues upon which all the theory which we suggested to you in 1881 depends:

1. "That certain forms of micro-organisms, viz: Micrococci, oval bacteria and short bacilli, are invariably present in carious dentine."

2. "That these micro-organisms extend into the tissue as far as does the caries."

3. "That no agent can be made to produce a change resembling caries in the absence of such micro-organisms."

(The fourth I omit.)

They add: "We feel convinced that the process, to be effective, must be carried on in a living mouth, probably because that is the only situation in which the special germs are really active. Analogy seems to warrant this deduction; but, "all we claim for the germs is, that without them and their products the process could not go on at all," and "the dental pathology of the future must include them among the most powerful factors in the production of this disease."

To Underwood and Milles the world is indebted not only for the facts which they were the first to demonstrate, but also for the impulse which their labors gave to other men to make additions to their discoveries.

In the *New England Journal of Dentistry*, Jan., 1883, Prof. Mayr gives the results of a series of very careful experiments made in the line of analyzing decayed dentine. Of these experiments Underwood and Milles say: "Prof. Mayr has worked out the chemical aspect of the question with great care and exactness." That he is fully competent for a work of this kind, involving great care an labor, no candid man, who is at all acquainted with him personally, with his educational training in the best schools in Germany, his acquaintance with medical and other sciences, and especially his ability in his chosen profession as a chemist, will for a moment question. I give the results of his experiments on the point bearing on the question of dental caries. First, he says: "Let us never confound two things; the structure of a tooth and the chemical nature of a tooth, and that the structure may be broken down and the chemical nature not changed. Result No. 1. No acids or chemical lime-salts are found in the innermost decayed mass. While the chemical composition of the innermost layer is almost (and as was seen in some cases completely) identical with that of healthy teeth, the structure is totally different. The soft, white, friable decay is no longer organized, though chemically only slightly differing from the tooth substance—one showing 72 per cent. lime-salts. The action at the innermost layer is not in accordance with what we know about the action of acids."

This paper of Prof. Mayr is full of suggestions and facts bearing directly upon the chemical aspect of the question of caries, and furnishing much evidence in favor of the septic theory.

Dr. W. D. Miller, of Berlin, within the last two years, has published many papers giving at length the processes of his experiments and observations relating to caries, which deserve notice. He then gives the description of the investigations which led him to several conclusions, of which I quote the following:

"The bacilli penetrate far into the dentine, even into the finest branches of the canaliculi. Micrococci penetrate furtherest" (i. e., further than the minutest branches (?)). "The fungi produce anatomical and pathological changes in the deeper layers, stop up the canaliculi and necessarily lead sooner or later to the death of the dentinal fibrils. The outer layers of dentine, thereby deprived of nourishment, die and fall a prey to putrefactive agents."

Dr. Miller thus fully confirms the observations of Underwood and Milles, of Lister, and Rottenstein, and every other careful observer, and the presence of organisms in the deeper portion of carious dentine may be considered as fully established.

Dr. Miller differs from Underwood and Milles in this: He claims that there is a zone of softened dentine between that occupied by the organisms and the healthy dentine, which is not infected. His opinion is based on microscopical observations, and this after having said that the bacilli penetrate even into the finest branches of the dentine (softened dentine), and the micrococci penetrate further still.

Underwood and Milles, on the other hand, prove that the germs are present up to the uttermost limit of the affected dentine, by inoculating a pure culture with matter taken from the deepest portions thereof—from the very border line of decay. In other words, they find them attacking the living *organic tissue* of dentine. The question of the effect of their presence here is now the one of paramount importance. The settlement of this very interesting question does not depend upon what organisms or acids may be doing at the more superficial points of the carious mass, nor whether the acids are organic or chemical, but what is going on at the line of battle where the amæba-like cells of the organisms and bioplasson are contending for dear life and for food to sustain that life.

Neither Underwood and Milles, nor Dr. Miller, are able to solve this question on the theory that organisms do their work by the acids which they produce. The former say: "The essential element wanting in our artificial experiments is present in the mouth." Dr. Miller says: "I am a believer in acids, a believer in micro-organisms, and a believer in an unknown cause; that is, I believe that there are agents active in the production of caries which are yet to be discovered."

Two questions here arise:

1. Is the tooth endowed with living matter capable of taking on inflammatory action?

2. Is there evidence to conclude that the results of inflammatory processes in dentine are analogous to those in bone and other tissues?

In answering the first question, I will refer you to the discoveries of Prof. Heitzmann in relation to the reticular structure of protoplasm, which connect every tissue and organ as it were into one large amæba, and to the researches of Dr. Boedecker concerning "The Distribution of Living Matter in Human Dentine, Cement and Enamel," together with the evidence which your own experience furnished in your operations upon the teeth. If these, united, do not bring evidence to your minds sufficient to make you give an affirmative answer, ask your patients. Do not think, because these tissues belong to the microscopic world, that they cannot be injured and take on inflammation. All normal and abnormal life action, whether growth or decay, the building up or the taking down of molecules and tissues, belong to the microscopic world. If you discard the vital changes in one set of tissues, why not in all? Yes, there is the intensest vitality in the reticular matter of the tooth. To talk of its low vitality is to contradict the plainest evidence that can be brought to the human intellect.

In answer to the second question, if you admit the self-evident fact of its ability to live and grow and be healthy, you must also admit its liability to disease.

This brings me to the consideration of the inflammation theory of Dr. Abbott.

It has been shown in the laboratory of Prof. Heitzmann that dentine has been dissolved and formation of abnormal tissue has taken its place. This has taken place by true physiological, though abnormal, vital processes. When Dr.Abbott was making his investigations in connection with Dr. Boedecker in regard to living matter in teeth, he observed in the diseased fibrils of the tooth appearances characteristic of the presence of inflammation in other hard tissues, which he thus describes:

"First, irritation, which he thinks is produced by acids, followed by inflammation, swelling of the living matter, which effects the dislodgement of the lime-salts; a melting down of the glue-giving basis-substance, and a bringing to view the embryonal elements of the enamel. These processes follow in greater intensity in the dentine. The lime-salts are not necessarily dissolved and taken away, but may, and I have no doubt, as Prof. Mayr's experiments show, do remain mixed with this disorganized tooth substance." On the hypothesis that acids produce the irritation of the living matter—the reticulum—at the border-line of decay, why should they not also decalcify the lime-salts at this line? Prof. Mayr finds no trace of acids there, and Dr. Abbott accepts the conclusion that they are not there. How, then, can acids set up inflammation? When the germ theory is accepted, the presence of acids at this point will be necessary to account for the agents of irritation. With vital organs feeding upon and multiplying within the pabulum contained in the canaliculi, exhausting and injuring the reticulum, which is directly connected with the reticulum of the pulp and the whole system of tissues, the usual effects of irritation follow until the melting down of the formed material, the liberation of the lime-salts from its meshes and the death of the reticulum put an end to the vital reaction, and the mass is given up to the action of organisms and their products.

The facts already presented are sufficient to establish the septic character of the disease affecting the albuminous or "animal" portions of dentine where caries is present.

In another article I shall present some of the facts already discovered in regard to the action of pathogenic organisms on soft tissues, and also examine the chemical theory which teaches that caries is simply the decalcification of the dentine by acids.—*New England Jour. of Dentistry.*

JOURNALISTIC.

"Reading maketh a full man; conference, a ready man; and writing, an exact man."

THE DIETETIC TREATMENT OF DENTAL DECAY.—By Dr. Price, Birmingham is the first article in the *British Journal of Dental Science*, of June 2. The article was read before the Midland Odontological society. Dr. Price in commenting upon what has been said by some authors, says: "That the onus of dietary rules is, by these gentlemen, thrown entirely on the mothers, so that while *in utero* the phosphates may be supplied for the formation of the teeth. Mr. Hawkins, however, is of the opinion that the second set could scarcely be benefited by the mother's regime, or during lactation, and quoted the authority of John Hunter on the subject." Now, I am an advocate for the foods given above, not as agents for *forming secondary* dentine, but because they contain a larger percentage of nutriment, and of a kind more likely to form, both *in utero*, and after birth, more perfect teeth than ordinary white bread. But if the full value of these, or any other benefits are to be secured to the offspring, not only the mothers, but the *fathers* of the children, must be taught the value of the foods recommended.

"The child is a modified reproduction of the structures of both its parents, and temperance and dietary precautions will avail but little if practised by one, but rejected by the other." * * * "Probably the onset of disease in dental structure, in every instance, is caused by the chipping or fracture of the enamel."

"Once the enamel is injured, the dentine is attacked, both by filth in the mouth and by disordered stomach. Hence, the necessity of cleansing the teeth, and the importance to them of the general health."

In America the subject of tooth powders and toothpicks is often under discussion, by the members of the dental organizations, but in England, dentists seem to think the subject beneath their notice, and relegate these matters to the chemists and patent medicine makers, and thus neglect one of the most important matters in conservative dentistry." * * * "The public require educating. By pamphlets, lectures, in the surgery, *from the house tops*, people should be taught that healthy children, strong in body, and who will have teeth capable of preparing food for digestion for the body's support, can only be born of parents, *fathers* and *mothers*, whose own bodies are in health, and properly nourished."

THE TREATMENT AND PREPARATION OF THE MOUTH PREPARATORY TO INSERTING ARTIFICIAL DENTURES.—By Samuel Adams-Parker, L. D. S., Eng. He advocates the retention of sound roots, and considers them valuable and essentially necessary at times, he also believes in temporary sets, and that they should be worn until shrinkage from natural or rather surgical causes has ceased.

CASES AND INCIDENTS IN PRACTICE is the title of the first editorial in this number. The editor urges the members of the profession to jot down the history of cases and give to their brethren who thirst for more knowledge and crave some of the precious drops from their cup of experience. "The perfection of knowledge as it may exist among men can come but as the curtain of life is casting its long shadows toward the grave and how many, alas! are there, who pass from our midst with all their wealth of hard-earned knowledge and leave but naught behind them—they and their treasures are alike lost to mankind."

"The knowledge which commences when a man first starts upon the active pursuit of his profession, when he is emancipated from the warping influences of text books, is the knowledge which he should make it his business to communicate to his brother workers." "This knowledge being composed of actual living facts—if we may be allowed the expression—is more valuable than all the armchair excogititations, the theorisings and multiplications of 'dry-as-dust' researches among the writers of the dead."

"There is an immense fund of knowledge made up of the practical every day facts, learned hour by hour in the consulting room and in the work room, which lies crystalized in men's brains, but never becomes common property." * * * "In America the 'incidents in practice' are collected with care, and American journals teem with such interesting and valuable fragments."

REPAIR OF CELLULOID DENTURES.—Another editorial. He recommends replacing by a new plate, first investing the broken plate, and then heating and pulling out when soft, then press in place a new blank. I prefer replacing with rubber. The Midland Odontological Society's proceedings are concluded in this number.

Mr. W. J. Watson took exception to the word 'price' as used by the speakers.

They had started their society on a scientific basis and ought to keep to similar terms and speak of fees and not prices.

As regards the medical men, he considered they did not do justice to dentists.

"A medical man ought to act more kindly, considering his own standing and position. The great difficulty dentists had to contend with was the matter of fees. Some people, when they wanted a set of teeth would say that such-and-such a person had had a set from a certain dentist and that they ought to have a set for the same amount. They seemed to have no idea of the difficulty to be overcome in different cases. He hoped the time would not be long before every family could not only have its doctor, but its dentist, upon whom they could place implicit confidence and rely at all times in securing efficient services at a moderate fee." The president said that during his long connection with dentistry, he had found that the medical men were generally easily managed, for, as a rule, they know nothing about teeth.

The president said that in his own practice he gave gas. He never gave ether or chloroform, except in the presence of a second medical man. He apprehended that in case of death, when about to perform an operation and the giving of ether at the same time, a person could not be held guiltless of death in the absence of a second medical man. It required one to look after the patient regardless of the operation.

"Chloroform was usually given in cases of midwifery, but only to reduce pain and not bring on unconsciousness. But a dental operation could not be performed without absolute insensibility, and here came the risk."

Mr. F. J. Sims said as a rule he called in a medical man when he administered gas, as the responsibility was so great, and, therefore, it was well to get several friends to share it.

H. B. VAN DORN, M. D., in a communication to this journal says: "I would suggest aqua camphora as a remedy, to be used in rinsing the mouth, and as a gargle, immediately before taking an impression. In my practice it proves infallible in preventing nausea and retching ?

The *Southern Practitioner*, (medical) furnishes the following editorial items:

GONORRHŒA, LEUCORRHŒA.—Elmore Palmer, M. D., Boulder. Col., says: I have thoroughly tested Pinus Canadensis in congestions, inflammations, and ulcerations of the different mucous surfaces, and find it all that is claimed for it. In Gonorrhœa and Leucorrhœa I am better pleased with its action than anything I have ever used. No failures thus far in upward of twenty cases.

NERVOUS HEADACHE AND GENERAL DEBILITY.—Curt H. Lovelace, Cashon, Tenn., says: "Celerina" in my practice, is the most satisfactory nerve medicine I have ever used; in nervous headache and general debility it is perfectly "fascinating."

The *Dental Record*, London: "Some of the Drugs used in Dental Surgery," is the title of a paper read before the Student's Society of the National Dental College, by Chas. W. Glassington, M. R. C. S., L. D. S., Edin.

The subject of his paper is one which is of great value to the dental surgeon, and yet during the time a man takes to qualify himself in dentistry it receives little or no attention from him. This is partly the fault of the student, but chiefly the fault of the faculty, who are his teachers. The sooner a Chair of Dental Materia Medica is founded in all our Dental Colleges, the better it will be for the future of our profession.

He gives Mr. Coleman's method of treating the so-called "dead-tooth" with arsenic:

"In those cases where the pulp has sloughed away, the canal cavities filled with puriform fluids, the dentine itself being moist and very offensive, and, as a rule, accompanied with periodontal irritation, due to the presence of septic substances, he has used arsenic with better results than ten or twenty applications of carbolic acid or creasote. His mode of procedure is this:—He simply clears out the pulp cavity, washes with carbolic acid and applies arsenic precisely as if for the destruction of a pulp, laying the application over the orifices of the root cavities, and then filling over with oxychloride of zinc. After an interval of two or three months, if the filling is removed, the pulp and root cavities will be found dry and perfectly sweet. * * * I well remember two cases, both were upper molars, distal cavities with suppurating pulps. The patients, who were going into the country, refused to have them extracted, and wanted them stopped. So after applying the rubber dam and carefully excavating, I placed a large cap of card-board, on one side of which was a paste of creasote, morphia, and arsenic, over the pulp cavity, filled with osteo, and told the patient that in the event of any pain or swelling to go and have the tooth out.

Both cases did well, and one came back a short time ago to have the tooth filled up again; the osteo having worn down. * * * My experiences are not sufficient to enable me to speak well of this mode of treatment. but when a gentleman like Mr. Coleman brings forward any addition to our knowledge of dental surgery, we may be sure he has good reasons for doing so."

"REPLANTATION AND TRANSPLANTATION OF TEETH" is the continuation of a paper by R. Theodore Stack, M. D. Dubl., F. R. C. S. He divides the cases into three varieties:

"1. Where a truly dead tooth is replanted.

"2. Where teeth in which the vitality of the periodontal membrane is unimpaired, but from which the pulp has been extracted, and are rapidly introduced into the socket.

"3. Where teeth are replanted or transplanted without interfering either with the vitality of the periodontal membrane or with that of the pulp."

He believes that if due precaution is taken to retain the vitality of the periodontal membrane while the tooth about to be replanted is out of the mouth, there need be little apprehension of absorption of the roots.

The Independent Practitioner, June, "Fermentation in the Human Mouth." The influence of antiseptics, filling materials, etc., upon the fungi of dental caries. By Dr. W. D. Miller. Continued from the May number.

He says: "Having established upon an experimental and scientific basis the fact that caries of the teeth is, to a certain extent, the direct result of the action of ferment acids upon the tissue of the tooth, followed, particularly in the case of the dentine, by the action of the ferment organisms themselves upon the decalcified tissue, it becomes a matter of the first importance to determine,

First. By what means we may counteract the action of the acids or prevent their production.

Second. By what means we may save the already decalcified dentine from complete destruction.

Evidently there are three methods by which the desired end may be partially obtained:

1. By repeated, thorough, systematic cleansing of the oral cavity and the teeth, we may so far reduce the amount of fermentable substances in the mouth and the number of ferment organisms, as to materially diminish the production of acid.

This is so self-evident that it needs no further comment.

2. By the repeated application of alkaline substances we may, to a certain extent, neutralize the acids before they have acted upon the teeth to any considerable degree.

3. By a proper and intelligent use of antiseptics we may destroy the organisms themselves, or at least render them inactive.

It is this method which is especially applicable in the second stage of dental caries (*i. e.*, the stage which follows the decalcification), and to which we will give exclusive attention.

We must, however, constantly bear in mind that by whatever method we proceed, a previous thorough cleansing of the teeth is absolutely indispensable.

There is no known solution, alkaline or antiseptic, applicable in the human mouth, which will penetrate between the teeth or to the bottom of fissures and cavities, when these are filled with food, in sufficient quantity to have any appreciable effect,

Therefore, before all antiseptics or alkaline washes, come the tooth-brush, tooth-pick, and floss silk." * * * "We need, therefore, a material for filling which is not only antiseptic at the time of insertion, but which remains permanently so after being inserted."

H.

BIBLIOGRAPHIC.

ON EMBRYOLOGY.—With special reference to the development of the teeth and contiguous parts. By J. S. Williams, D. D. S., New Haven, Conn. Reprint from the "Dental Cosmos."

The series of articles on embryology which have appeared in late numbers of the "Dental Cosmos." have justly attracted wide-spread attention. The paper was originally read before the New England Dental Society at Providence, R. I., October 4, 1883.

Those who have made a study of the histology of the dental tissues are deeply interested in the position taken by Dr. Williams. For instance, Prof. Garretson, of Philadelphia, asserts that the development of the teeth as a process is *sui generis*. Dr. Williams disputes this assertion, and shows very clearly that "the history of the early stages of the development of the teeth is almost identical with that of the development of the placoid scales of the elasmo branch."

The existence of the *membrana preformativa* of RaschKow is doubted by Dr. W., although its presence is recognized by Magitot, Legros and other histologists. The question of the precise function of the enamel organ has long been in doubt. Dr. Williams is satisfied that it is a true secreting organ, and supplies by secretion the material for the formation of enamel.

The ganglionic nature of the odontoblasts is also a discovery made by the author of this pamphlet, and the tracing of the dental fibrillæ as simple prolongations of these cells, seems to be conclusive evidence of the truth of this claim.

The paper is a remarkable document and is deserving of the most careful study.

Fermentation in the Human Mouth; its relation to caries of the teeth. By Dr. W. D. Miller, Berlin, Germany. Reprinted from the Independent Practitioner, Price 50 cents.

This pamphlet is devoted to the subject of the etiology of dental decay and is unquestionably the most important paper upon this subject that has yet been published. It is not practicable to here follow the author through the years of experimentation that he has given to this study, and we must content ourselves with a brief synopsis of his conclusions. He decides that micro-organisms are always present in carious dentine, although large areas of softened dentine are found that contain no fungi; that the softening of dentine is of the nature of a true decalcification, and the process of decalcification diminishes as we advance toward normal dentine; that fungi exist in great numbers, not only in carious dentine, but also in human saliva; and that these fungi have the power of producing acid under the ordinary conditions of the mouth, and that caries of dentine can be artificially produced which cannot be distinguished from natural caries. Dr. Miller adds in a foot note that he has "succeeded in producing deaths by septicæmia of both mice and rabbits by injecting into the lung saliva from the mouth of a perfectly healthy person."

The two foregoing papers serve as a clear indication that dentistry is in a fair way to escape from the humiliating condition pointed out by Dr. A. H. Thompson in his paper on "Scientific Methods in Practice," which appears at the beginning of this number.

CORRESPONDENCE.

Editor Archives of Dentistry.—How is it possible to answer that which is not argument? Dr. Richardson reminds me of a certain lawyer in a case before one of our courts, who was more *supple* than argumentative. In his speech he went through all the contortions possible, gesticulating in the wildest manner, bending down in grand swoops to the floor, rearing back as if for a double back action movement, swaying his body from side to side, stamping the floor, clutching the chair, clenching his fist and rolling his eyes as if in the last throes of death. All this doubling and twisting without argument or reason.

I will have to answer the Doctor in the same way *this* contortionist was answered by his opponent, who arose from his seat, addressed the court and in pantomine delivered the gestures and gesticulations of his opponent for about the same length of time and then remarked to the court that he considered his opponent fully answered.

B. H. CATCHING.

Atlanta, Ga.

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ERRATA: On page 293, bottom line, for "indorcence" read "indolence."

EDITORIAL.

AN IMPORTANT DECISION.

The Supreme Court of the State of Illinois has recently passed upon a question defining, upon one point, the powers of the State Dental Examining Board of that State, and this decision may serve as a precedent for like decisions in other States.

The Illinois Board, in the belief that the law of their State gave the board that power; determined for itself the standing, reputable or otherwise, of the dental colleges whose diplomas were offered in evidence of the qualifications of the holders' to register for practice in that State.

In the exercise of this power the board held that a college which conferred degrees on less than two full courses of lectures, or their equivalent, was not a reputable dental college, and accordingly denied registration to a graduate who had received his diploma on a single course. The college granting the degree—the Indiana Dental College—applied to a Judge of the Supreme Court of Illinois for a mandamus, to compel the Examining Board to allow their graduate to register.

The Judge—SCHOLFIELD. 1. "*Held*, that the Board has power to determine whether the applicant for license has graduated from a 'reputable dental college or not;' that in making this determination it acts in a judicial capacity, and from its decision in this respect there is no appeal.

2. Mandamus.—That in certain cases the Court could by mandamus compel the Board to act, but it could not compel it to act in a particular manner.

In this case the board had already acted, and the court held it had no power to reverse that action.

The question whether a college be reputable or not, is a question of fact, which the board is alone authorized to determine. The court might compel the board to determine a fact, but could not direct in what way the board should decide, "however clearly, it be made to appear what the decision ought to be."

"The demurrer here does not admit that the Board of Dental Examiners found that the college at which the relator was graduated, was reputable, although it does admit that to be the fact. But, since the board cannot be compelled to decide the question that way, although the evidence might clearly sanction it in doing so there is no ground for mandamus."

The matter may be briefly stated thus: The Board of Dental Examiners makes a rule applicable to the granting of diplomas by dental colleges, and no matter what may be the qualicfiations of the individual applicant, or tne standing of the college from which he graduated, he cannot register in their state under the authority of a diploma issued by any college that does not comply with the rule of the board.

That there is at least one dental college,—the Wisconsin—*not reputable*, is evident. That the power to determine what are and what are not reputable colleges, should be lodged somewhere, is equally clear. The difficulty that arises when that power is exercised by examining boards, is that each board has authority only within the limits of its respective state, and hence the diplomas of a college may be rejected in one state and received in another. In Missouri that question is left to the courts, but whether a court or an Examining Board will make the wiser decision, is yet an undetermined question. We are feeling our way in this whole matter of regulating practice by legal enactments, and time and experience will be necessary to settle a number of disputed points.

A NEW STEEL is said to have been produced at Sheffield, England, which is expected to be of incalculable value to the manufacturing and railroad world. It is said to be made "by adding from seven to twenty per cent. of the ordinary ferromanganese of commerce to iron either wholly or to a good extent decarbonized and refined and treated by any of the ordinary processes, or to steel produced by such processes." It is stated that a small test bar containing twelve per cent. of manganese was bent double when cold, and was sufficiently hard to turn iron ; that an axe containing the same percentage, and which had never been hardened or tempered, cut in two a bar of iron half an inch square. A correspondent of *The American Manufacturer*, giving these facts, says that the steel is capable of being hammered or rolled the same as ordinary steel, and showed no magnetic qualities. If these accounts are in any measure correct, the discovery is likely to prove of great economic importance.—*Am. Jour. of Dental Science.*

THE

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ORIGINAL ARTICLES.

"Of all the arts in which the wise excel,
Nature's chief masterpiece is writing well."

THE VALUE OF THE MALLET IN PLUGGING TEETH.

BY A. MORSMAN M. D., D. D. S.

[Read before the Iowa State Dental Society May, 1884.]

It is something over forty-five years since the mallet was introduced to the dental profession as a means for consolidating gold. Doctor Atkinson first brought it into notice, although I believe he has stated that it did not originate with him. It did not come into general use for about twenty years after its introduction, when, owing to the increasing use of cohesive gold, it became exceedingly popular, and many were the disputes as to the material of which the instrument should be made and the character of the blow. Wood, tin, lead, ivory, steel, iron, zinc, horn, vulcanite and soft rubber, all had their advocates. Some of these were championed zealously as though the safety of plugs and reputations depended entirely on them, while "Heavy blow" "Light blow," "Elastic blow" and "Dead blow" resounded on all sides. Genius was also at work and soon produced "automatic" mallets that would do their own hammering. Of these there are about a dozen. In 1856 electricity was put forward as a dental assistant in the character of Dr. Green's electric mallet, which was soon followed by one of Dr. Jack's invention, both now superseded by the Bonwill-Webb instrument, the culmination of electrical pounding. Of pneumatic mallets there have been several claimants for notice, and I find also that an instrument called "King's dental malleter" has obtained some prominence. With the invention of the dental engine came a demand for malleting attachments of which there are now some six or eight varieties.

I mention these facts to show how general malleting has become: The profession look upon that instrument as a necessary part of the dental armamentarium. It is regarded as indispensable to a successful practice. With some few exceptions every practitioner mallets every plug. None have confidence in hand pressure when the mallet can be used. Men in high places recommend it and use it. It seems to have come to stay.

To say that an operator never uses the mallet is almost synonymous with saying that he does slovenly work, and to attempt to prove that it has little or no value, will be looked upon as presumptive folly. Nevertheless that is what I shall endeavor to show in this essay.

Some form of force is necessary in manipulating cohesive gold. Two pieces of annealed foil will adhere when they are made to touch each other, but perfect cohesion is only the result of perfect contact,to attain which all air must be forced from between the proximate surfaces. Dr. A. Wescott has related how he had a package of foil sent by mail, and as it was in the days of high postage, the intervening papers were removed to save expense. When it reached him it was all welded in one mass, and he was unable to separate the leaves. Under favorable conditions, gold welds readily, and the force required to accomplish this is not very great. There are two methods in general use for applying this force in plugging teeth—malleting and hand pressure.

In an article written by Dr. Wetherbee in 1865, I find the force of hand pressure estimated to average ten pounds, and he says that it is often as great as sixteen or twenty pounds. Such pressure as that I believe to be excessive, and perhaps quite as objectionable as the mallet.

By hand pressure, as I shall use the term, I mean such force as can be comfortably exerted upon an ordinary mallet plugger held between the thumb and fingers, after the manner of holding a pen, and which need not exceed five or six pounds. I claim that this force is effective and sufficient, unless the foil is exceedingly heavy or the pieces dangerously large. I say dangerously large because the approximation of large pieces of gold to the walls of a cavity is decidedly uncertain by any method of working, and it is here that our success or failure is decided. Perfect juxtaposition means perfect protection and large portions invite failure.

I am in the habit of using number five foil folded sixteen thick, equal therefore to number eighty, and find no greater force than five pounds necessary. In fact it usually runs under that amount, as I have found by repeated tests.

To no patient is this amount of pressure unpleasant. It is silent, painless, and produces none of the dread with which the mallet is regarded by all save the phlegmatic.

Of course any operator knows that fillings of cohesive gold can be inserted by hand pressure. He has learned this because in only 60 per cent of the cavities as they present to him,can the mallet be used satisfactorily. He is obliged, therefore, to use hand pressure, but always with the feeling that such plugs are not as good as they would be if he "could only use the mallet." He has no confidence in such work and as to "contouring" without the mallet, that would never do at all.

In a large proportion of the cavities we fill we have four good walls, and there is no possibillity of sufficient force being applied to separate the layers of gold. In another large portion, we have three walls, and here too there is but little danger. In only a very small portion do we build on projecting pieces of gold liable to receive much strain. Now I submit that in all operations, at least, except the last named, a process, by which gold can be made to sustain by its own cohesion, a force equal to about eighteen hundred pounds to the square inch, is amply sufficient. Nor, do I see any use for the mallet in contouring. Certainly nowhere else is there the slightest reason for using it.

At first sight it would seem that two surfaces of gold hammered together would unite more firmly than by other methods. Perhaps we get that idea from the blacksmith, who welds his iron by the strongest blows of which he is capable. Whatever the origin of this opinion, I believe it to be erroneous and that no blow admissible in the mouth will weld gold more firmly than pressure. I hope to offer sufficient evidence to prove my position.

It has been claimed for the mallet that it has the following advantages over hand pressure:

1. It is a time saver.
2. It is less unpleasant to the patient.
3. Condensation is more thorough.
4. It is easier for the operator.
5. Cohesion is increased and the plug is thereby strengthened.

Let us see how many of these claims are true.

First. Is it a time saver? In an article written by Dr. Geo. McDonald advocating the electric mallet, he says plainly that it does not save time. I have repeatedly tried myself with a known quantity of gold in similar cavities both with the electric mallet and hand pressure. The difference has been very slight and was sometimes one way, sometimes the other. I use both methods with equal facillity. I think more depends upon the habit of the operator than upon the method. Surely the automatic mallet can not be a time saver because the movements are identical, we are obliged to use hand pressure in order to spring the instrument. Two persons working on the same cavity might operate a little faster than one, but that is not on account of the mallet. It is because the assistant aids in other ways. Certainly no operator can use the hand mallet alone and save time over hand pressure. Nor can we use pluggers with larger surface under the mallet than under the hand, except by increasing the blow. The larger the point the greater the force required to condense the mass that is covered by it.

Second. It is less unpleasant to the patient?

This claim has been made although it sounds like a burlesque. We all know better. I have never questioned a patient yet who did not dislike the mallet, although willing to submit to what they considered inevitable. To some persons it is worse than actual pain. Many a nervous lady with a mouth full of experience has thanked me gratefully when I have told her I would not use the mallet. What dentist has not heard the cry "Please use soft filling; I can't stand it to have gold put in." This is one of the strong points of our "New Departure" friends. Much of the force of the argument would be lost if it were not for the malleting. I take the following sentence from an article by Dr. Darby in the "*Dental Cosmos*": "Few of us feel that we could dispense with all the various mallets so generally in use, and yet how reluctantly do we submit to a protracted operation upon our own teeth, when the hand mallet is to be employed." The Doctor evidently considers hand malleting as unpleasant, and as a remedy he recommends in the same article the electric mallet! Suffering Martyrs! Set three hand mallets to work instead of one, add to them the noise of a nest of bumble bees and you have the effect of the electric mallet upon a patient. I consider it the most disagreeable of all this class of instruments.

I am satisfied that many patients are harassed and fretted by operations that could be rendered much easier for them. Our work is preeminently pain producing, and it is our duty and should be our pleasure to use every means consistent with the utillity of our work to save our patients pain and annoyance, and to remove that dread that keeps them away from our offices until pain drives them there. We have studied mechanics so much that we have had no time for physiology. It is not a piece of phosphate of lime only that we are working on; the owner of the tooth is there and has brought all his nerves with him. How often we see a protest against such treatment in the periosteal inflammation that follows severe malleting. The automatic mallet is a particularly disagreeable instrument, only out-ranked in this respect by the electric.

Third. Condensation is more thorough. Dr. Truman made some experiments by inserting gold into a hole in a hardened steel matrix by different methods, the weight of the gold determining the relative density. The conditions were not the same in all, as different bases were used. These experiments seem to show that the electric mallet condenses with the greatest thoroughness, while the hand mallet, the automatic mallet, and hand pressure are about alike, the automatic mallet making the worst showing of all. A thing which I cannot account for as the blow of an automatic (Snow and Lewis) is quite as forcible as an electric. However that may be, the claim is a matter of no unimportance whatever. It is not condensation that we want, it is approximation.

I can not understand why this claim should ever be advanced as an argument in favor of malleting. I do not think it was ever heard of until the electric mallet came into use. Density to a certain point is desirable; beyond that it becomes crowding, and is detrimental. It is not unusual to see a plug of soft gold into which a pointed intsrument can be forced and yet it may have preserved the tooth for years.

Fourth. It is easier for the operator. Here again, the habit of the operator has much to do with the question. I am willing to admit that malleting is easier than the application of a force equal to sixteen or twenty pounds by hand, but I am not willing to admit that it is easier than light hand pressure. In a long operation it is undoubtedly a relief to pick up the mallet for a while, just as any change is a relief. And I can see no objection to using it in that way, but it should be borne in mind that what ease is gained is at the patient's expense. I think but few operators would use such an objectional instrument as the mallet merely because it was easier for them.

Fifth. Cohesion is increased.

For some time I have been experimenting on this point with different mallets and comparing the results with hand pressure, both in the mouth and by the aid of mechanical appliances out of the mouth. My first experiments were with shoe eyelets, and I published a part of them about a year ago in the *Cosmos.*

They were crude and inaccurate, because of the difficulty of retaining the eyelets firmly in position while the work was going on. I then made two brass plates $\frac{1}{8}$ inch thick $\frac{1}{2}$ inch wide and one inch long, and, clamping them firmly together, I drilled a hole through the center of both plates, and counter sunk it on the outer surface of each plate, so that it would be easier to remove the gold and to guard against any possibility of its pulling out under the strain. I then drilled two other holes on either side of the center one. These together with a small iron glue-clamp with a slot filed in it to work through, constituted my apparatus. The manner of performing the experiment was as follows: One half of the brass couplet was clamped to the work bench with the counter sunk surface down and the center hole filled with gold by whatever method was selected. When full the surface was made even by a foot plugger, so as to do away with the interlocking of projecting portions of gold. The clamp was then removed and the other half of the couplet placed in accurate position, counter sunk surface up, and clamped there. Accuracy was insured by passing steel pins through the holes in the ends of the plates. Being now in position the filling was continued through the upper plate. Removing the clamp we have the couplet united by gold, and now by means of strong silk thread passed through the end holes, one piece of the couplet is suspended to a fixed point, and the other supports a pan into which shot is poured until the couplets are separated.

With this couplet I made fourteen experiments, the following being the greatest weights sustained by the methods used:

	lbs,	oz.
Hand Pressure—Serrated Plugger No. 18. Palmer's Nerve Canal Instruments,	7	2
Two ounce tin mallet, same plugger,	5	5¼
Electric Mallet—Moderate blow, Plugger No. 1,	5	14½
" Very heavy blow " "	6	13
Hand pressure smooth faced Plugger same size as in first experiment,	4	14
Snow and Lewis—very heavy blow Point No. 1,	7	3

It will be seen that the pluggers were as nearly the same size as possible. The gold used was the same in all, "Globe" semi cohesive No 5 folded to eight thicknesses between paper, and cut into strips one sixteenth by one quarter inch. It was annealed by passing through the flame of a spirit lamp.

I think these experiments show that no blow we are in the habit of using in the mouth exceeds hand pressure in effecting cohesion, and we are probably using as heavy blows as are justifiable.

They show also that smooth faced intsruments are not as effective as serrations, probably because the latter increase the extent of surface. The Snow and Lewis plugger was used in its fullest capacity and gave, in my opinion, a blow too heavy to use in the mouth. The electric mallet was also at full capacity, with the battery one week old.

I wish to record also, two experiments made with shoe eyelets, in matrices of lead clamped together in the same manner as the above, and other conditions also just the same. One was with the electric mallet and sustained a weight of twenty-four pounds fourteen ounces. The battery in this case was freshly prepared.

The other experiment was by hand pressure, and this couplet supported just twenty-five pounds.

In conclusion I wish to say that, while experiments of this character can not be performed with absolute accuracy, every effort was made to eliminate errors, and I believe them to be sufficiently exact to point toward the truth.

In regard to work in the mouth, I am firm in the belief that no mallet can make as nice approximation to the walls of a cavity, as can be made by hand presaure, given equal skill in both cases. Also that success when only a moderate degree of skill is possessed, is ten to one in favor of hand pressure. Also that the beauty and durability of hand pressure plugs can not be exceeded by the mallet.

CASES OF ABSORPTION OF THE ROOTS OF THE PERMANENT TEETH.

BY A. H. THOMPSON, D. D. S., TOPEKA, KAS.

It is not my purpose to present a discussion of the etiology of the disease of absorption of the roots of the permanent teeth in any of its various phases, but to submit observation upon cases of well marked characteristics. I hope thereby to contribute something to the clinical history of the disease and elicit some discussion by the members which will throw some light upon this obscure lesion. I therefore submit the following notes:

CASE I. Woman, æt. about 40, sanguine-lymphatic temperament; teeth of good quality, but affected by salivary calculus and pyorrhœa-alveolaris. Had treated for calculus with some benefit, but could not alleviate looseness of four upper incisors, nor their tendency to abscess. There was chronic inflammation over the roots of these teeth and a constant exudation of pus about them. She appeared one day with these teeth in an advanced state of suppuration, very loose and the crown of the left central apparently broken and hanging by a slight attachment to the gum; the teeth were removed and after the crown the root of the left central was taken out. Upon cleansing this tooth presented an unusual appearance and conformation due to absorption. At the neck of the tooth on the posterior wall absorption had apparently commenced and progressed through the dentine to the opposite wall, passing around the pulp canal and within the cementum, attacking the cement and the secondary dentine in the pulp canal last. This secondary dentine in the pulp canal stands out from the ragged ends of both the crown and root pieces of the tooth like a tube, and contained the pulp. The cement seemed to resist the absorption longest and projected from the ends of the fracture. Close examination of the eroded parts suggest that the process must have been a true absorption by an absorbent organ, and not be due to the chemical solution of acrid pus. The absorbed surfaces present the aspect of the crown of the deciduous teeth whose roots have been absorbed. The resisting power of the tube within the pulp canal was due likely to its great density and perhaps its vitality. The resistance of the lamina of cement must have been due to its vitality, as it persisted and acted exactly as the cement about the deciduous crown.

The cause of absorptionin this case is difficult to trace. There was no history of accident or other extraneous cause to account for a fracture. Only two causes suggest themselves of being the possible origin of the disease. First, the pathological condition of the gum and periosteum and the possibility of an hypertrophy of the periosteum giving rise to an absorbent organ. Second, the irritation arising from the internal occlusion of the inferior incisors and their impaction against the walls of the upper incisors. The teeth both above and below protruded in that unsightly manner so often seen in cases of calculus in pyorrhœa-alveolaris. The striking of the inferior incisors upon the necks of the teeth being a cause of irritation only suggests an origin of the absorbent organ. These causes are, of course, remote, but were the only ones suggested by a study of the case. The history is interesting, but its explanation is difficult.

CASE II. Woman, æt. about 30, sanguine-nervous temperament. There was no more calculus than we see in the average mouth,and no disease arising from·it. The tooth is a left upper lateral incisor which six years ago appeared to have a small fistula over the centre of the root. The tooth being alive, I diagnosed necrosed alveolus, and probing, found and removed some small scales of bones. A little temporary cessation of the fistula followed, but the tooth became quite loose. After some months of external treatment, I reluctantly opened into the pulp canal from below and found life as I feared, and applied devitalizer. After repeated applications, I gained an entrance and removed part of the pulp, which was difficult as the crown was deformed and curved inward, thus preventing direct access. But about half way up the root, opposite the fistula apparently, I was balked by striking life which "seemed like the gum," as the patient described it, and I became disagreeably aware that I encountered a perforation, but one which I had not made at any rate. I did not go further, but treated from time to time with some relief and a gradual cessation of the abscess and finally closed the canal and opening. A filling had been upon the distal side of the tooth and had failed, but as the pulp was alive this could have had no effect. After a year or more the patient presented with the tooth in an alarming condition. It was very sore and loose, the gum receding, the tooth pitched forcibly toward the canine, leaving a space toward the central and the gum over the root depressed and dark; the fistula appearing at times and then subsiding. Not deeming it possible to accomplish anything by opening of the pulp canal again, I confined my treatment to external applications, and wedging from the canine, which gave much relief, and was continued by the patient for some time. At this stage I urged extraction, but the patient would not consent, so the tooth remained in the condition described for two or three years. Severe inflation supervened occasionally, which was controlled by iodine, and by wedging the tooth was kept tolerably comfortable, but pertussion and loosening increased until wedging gave no relief, and during the last spring I removed it. It then appeared to be mal-formed, and that may have been the cause of the trouble. In addition to the crown being curved and dwarfed, a supernumerary root like a "corn-sucker" appears upon the distal side.

And now, by a post-mortem diagnosis, we can say that the pulp in this root dying—perhaps on account of the intrusion of the filling, caused the fistula at its apex, half way up the length of the main root. In examining the tooth we notice, first, at the apex the corrosive effect of pus with the usual rough, irregular appearance and the destruction of part of its length. Next at the position midway of the root, just at the apex of the supernumerary root, we notice a depression giving evidence of apparently true absorption by an absorbent organ. It does not look like the effect of caries, although it lies at the situation of the fistula. It must have reached to the pulp chamber and presented the opening which I found on exploring the canal, but if it was an absorbent organ which I touched, I am not prepared to say. The depression noticed lower down upon the neck of the teeth was probably due to caries, as all that portion was exposed by the recession of the gum.

The cause of the diseased action in this case appears, as nearly as we can judge, to have been the malformation of the tooth, leading to the death of the pulp as the direct cause of the fistula, the necrosis of the alveolus,absorption of the root in the spot described, and recession of the gum leading to a true exfoliation and effort of nature to be rid of the tooth. We notice two kinds of absorption or destructive process, as having attacked the tooth.

First, the results of true absorption by an absorbent organ as exhibited in the crater-like depression, and second, by the condition of the apex, part of it being totally gone and the stump roughened. The etiology of these separate phases are each interesting in their way, and deserving of study, but we cannot here make a differential diagnosis. Both must be the effect of the solution ofthe lime salts by an acid, but by a different action. In one it is by a mere maceration, in the other by the contact of a secretive mass accompanied perhaps by motion. We know that some boring shells work their way in the harder rock by secreting an acid and by motion. Perhaps the absorbent organ, by a sort of ameoba-like movement, pushes and turns upon the bottom of the pit it makes and with the acid eats away the substance of the tooth, but of this we are not certain.

A SIMPLE PLAN OF VENTILATION.—The following simple method for ventilating ordinary sleeping and dwelling-rooms, is recommended by Mr. Hinton in his "Physiology for Practical Use": A piece of wood, three inches high, and exactly as long as the breadth of the window, is to be prepared. Let the sash be now raised, the slip of wood placed on the sill, and the sash drawn closely upon it. If the slip has been well fitted, there will be no draft in consequence of this displacement of the sash at its lower part; but the top of the lower sash will overlap the bottom of the upper one, and between the two bars perpendicular currents of air, not felt as draft will enter and leave the room.

DENTAL SOCIETIES.

THE TWENTY-SECOND ANNUAL MEETING OF THE IOWA STATE DENTAL SOCIETY.

The society met in Probstel's Hall, Council Bluffs, Iowa, Tuesday, May 6th, 1884.

The meeting was called to order by the President, E. E. Hughs, of Des Moines. The minutes of the twenty-second annual session were read by the Secretary, J. B. Monfort, and approved. Thirty-two members answered to their names at roll call, and as many more, members and visiting dentists, were present during the session. On motion of Dr. W. O. Kulp, the Secretary was instructed to send greetings to the joint meeting of the Kansas and Nebraska State Dental Societies in session at Hiawatha, Kansas.

On motion of Dr. A. O. Hunt, of Iowa City, physicians and scientific men of the city, and visiting dentists were invited to meet with us and take part in the discussions.

The Executive Committee reported a reduction in hotel rates and railroad fares.

The Secretary read the report of the former Secretary and Treasurer of which the following is a synopsis:

No. members at last report		63
" " received at last meeting		9
" reinstated		1
Total		73
Lost since last meet'g by non-payment of dues	5	
" " " " " removal from State	4	
Transferred to Honorary list	1—	10
Total No. in good standing at this time		63

RECEIPTS AND EXPENDITURES.

Cash on hand at last annual report	$ 8 66
Received for dues and membership fees	174 00
Total	182 66
Expenditures as per Vouchers	110 66
Cash on hand May 5th, 1884	72 00

The report was audited by the Executive Committee and found correct.

Adjourned until 2:30 P. M.

AFTERNOON SESSION

Society met persuant to adjournment, eleven dentists not members of the Society reported present.

The Publication Committee reported having found a Stenographer, W. F. Wolff. On motion the Society employed him.

The Vice President, F. M. Shriver, Glenwood, then took the chair while the President, Dr. E. E. Hughes, read his address, which was listened to with much interest.

Dr. W. O. Kulp, chairman of the committee appointed for the purpose of having our code of Ethics printed on card board in suitable size for framing, reported them printed and ready for distribution. Members that have not a copy of the code of Ethics can have the same by writing to the Secretary.

Dr. Sanborn then read his paper on "Anesthesia."

After a lengthy discussion, adjourned until 8 P. M.

EVENING SESSION.

President Hughes read a communication signed by a number of prominent dentists of the United States in regard to organizing a National Dental Association, to have Washington, D.C., as its fixed place of meeting. On motion the communication was referred to the following committee of three, to report to-morrow: A. O. Hunt, W. O. Kulp, T. A. Hallet.

Dr. Hunt then read his paper, "A Method of Mounting a Porcelain-faced Crown," after which a recess was taken to examine the crown, also one showing the various steps in its construction which Dr. Hunt had to exhibit.

After recess Dr. Wilson described a case in which he made an incision and extracted a third molar tooth from a fistulous opening on the face, the tooth which the doctor exhibited had a large deposit of sanguinary calculus.

Adjourned.

Wednesday morning was devoted to clinics. Prof. L. C. Ingersoll gave a clinic in filling the pulp canals of an inferior first molar.

Dr. E. I. Woodbury showed the Society a method of obtaining metal dies directly from the impression. He used a perforated copper impression cup, using sand and plaster for the impression.

After thoroughly drying, puts it in an iron flask made for that purpose, and pours the metal into the impression.

At the opening of the afternoon session the membership committee recommended for active membership the following, who were elected: A. J. Capron, Creston ; F. W. Emery, West Union ; E. D, Bower, Le Mars ; H. S. West, Council Bluffs ; Mrs. M. West, Council Bluffs ; J. B. Cole, D. E. Smith,Davenport ; L. F. Kellogg, Waukan. On recommendation of the committee L. J. Walters, of Cedar Rapids, and C. Thomas of Des Moines were reinstated, and C. A. Billings, Marshaltown, was changed from a junior to an active member, he having graduated at the Philadelphia Dental College.

The next subject on the programme was taken up, viz:—"Loose Inferior Incisors and their Treatment," by J. Hardman, Muscatine. After an interesting discussion Prof. Ingersoll read his paper on "Dental Therapeutics."

A short recess was taken, after which the Committee to Examine Candidates for Graduation in the Dental Department of the State University reported having been present at the final examination of the class of 1883 and '84 in March, 1884, and that they were highly pleased with the examinations, which showed the thoroughness of the work of the winter.

Dr. D. F. McGraw, of Mankota, Minn., then read his paper on Bridge-Work. After discussion adjourned until 8 P. M.

Evening session was called to order by the President. The Secretary reported having received a telegram of greetings from the Kansas and Nebraska Dental Societies, and that he had received letters of regret from Drs. W. H. Barker, G. North and M. L. Jackson.

Election of officers and selection of a place for our next meeting made the first order of business for Thursday afternoon.

The discussion of Dr. McGraw's paper was resumed for a short time.

Dr. Hunt, as chairman of the special committee to whom the communication in regard to organizing a National Dental Association at Washington, D. C., was referred, reported the matter back to the Society without action. After lengthy discussion a committee was appointed to select six delegates and alternates. On recommendation of the Membership Committee J. S. Keagle, Clarinda and F. B. Eshelman, Harlan, were elected active members.

Adjourned.

The following named gentlemen operated at the Thursday morning clinics: Dr. J. E. Low, Chicago, put on a Butner crown ; Dr. McGraw, Mankato, Minn., Bridge-Work ; Dr. W. O. Kulp, heroic treatment of an abscess with fistulous opening, filling the canal at the same sitting and filling the cavity of decay with gold, by the Herbst method.

THURSDAY AFTERNOON.

Society met pursuant to adjournment. On recommendation of the membership committee, the following were elected active members of the Society:

E. Showalter, Waterloo.

G. A. Vaugn, Eagle Grove.

Dr. J. Hardman, President of the State Board of Dental Examiners made his annual report for the Board.

On motion of Dr. Wilson, Dr. J. T. Abbott was recommended to the Governor as his own successor on the Board. On motion a committee of three were appointed to prepare resolutions expressing the sentiments of this Society in regard to the Dental College at Delevan, Wis.

Dr. C. H. Darby of St. Joseph, Mo., explained to the Society a method of his, of attaching artificial crowns to natural roots.

The special order of business was then taken up, which was the election of officers, which resulted as follows:

President, S. A. Garber, Tipton ; Vice President, L. E. Rogers, Ottumwa ; Secretary, J. B. Monfort, Fairfield ; Treasurer, J. S. Kulp, Muscatine.

Des Moines was then selected as the place for our next meeting. Dr. Ingersoll offered the following as an additional By-law, which was adopted. "The Annual Meeting of this Society shall be held each alternate year at Iowa City."

On motion the Publication Committee were instructed to have the proceedings published in the ARCHIVES OF DENTISTRY according to the proposition made by the agent of that journal.

Adjourned. The rest of the afternoon was devoted to unfinished clinics.

EVENING SESSION.

Membership Committee reported J. C. Holland, of Danville, for active membership. On motion he was elected.

The Special Committee appointed to prepare resolutions with reference to the Delevan (Wis.) College, made the following report, which was accepted.

To the officers and members of the Iowa State Dental Society.

Gentlemen.—Your committee to investigate the standing of the Wisconsin Dental College, located at Delevan, Wis., find that the said college is not a reputable institution in its own state among the dental profession. They have evidenced their opinion in the action of the Wisconsin State Dental Society. The said society having had evidence that the above college was guilty of unprofessional conduct in resolving itself into a diploma manufactory for purly mercenary purposes and without regard to the attainments of its graduates, and further, that the said college does still continue to follow the same course to the detriment of the standing of the dental profession before the public, we submit the following resolutions.

Resolved.—That we discountenance the action of the Wisconsin Dental College and refuse to recognize its diplomas as satisfactory evidence of professional attainments, and hereby request that the Iowa State Board of Dental Examiners be guided by the action of this Society in this matter.

A. MORSMAN,
T. L. JAMES,
T. A. HALLETT, } Com.

The following, on recommendation of the Committee, were appointed as delegates and alternates to the meeting to organize a National Dental Association at Washington.

Delegates.	Alternates.
W. O. Kulp,	J. Hardman,
A. O. Hunt,	J. T. Abbott,
L. C. Ingersoll,	T. A. Hallett,
E. E. Hughes,	J. B. Monfort,
A. Morsman,	B. Price,
J. P. Wilson,	L. J. Walters.

On motion the selection of Essayists was left to the Executive Committee.

The Society then listened to a paper by Dr. S. A. Garber, entitled, "As the Teeth Need Saving, Amalgam or Gold, Which?"

Dr. Morsman read his paper on "The Value of the Mallet in Plugging Teeth," followed by Dr. W. O. Kulp, on "Gold for Filling Teeth."

As these papers all had direct reference to saving teeth, they were read and all discussed as one.

Adjourned until Friday 9 A. M.

FRIDAY, 9 A. M., FOURTH DAY.

After the meeting was called to order the President announced the next paper, "Artificial Crowns," by Dr. J. E. Low.

The following committee was appointed by the President to examine candidates for graduation in the Dental Department of the State University at the close of the next session. W. P. Dickinson, G. W. Fuller, E. D. Brower, L. E. Rogers, T. L. James.

G. W. Miller, of Winterset, read a paper on "Reflex Action" followed by a paper by T. A. Hallett, on "Dental Literature."

The following Committee of three were appointed to act as critics at our next meeting: W. O. Kulp, L. C. Ingersoll, T. L. James.

At this point the Executive Committee made their report. A vote of thanks was extended to the hotels and railroads for reduced rates; to reporters and press, for furnishing such a full report of our sessions.

A donation of fifty dollars was made the State Board of Dental Examiners.

It was made the duty of the Vice-President to provide for clinics for our next meeting and to have a general supervision of the same.

No other business being before the Society, President Hughes in resigning the chair, in a few well chosen words thanked the members for their attention and forbearance during his administration. The newly elected President, S.A.Garber, was introduced. After a brief speech acknowledging the honor conferred the rest of the officers elect were introduced, then the President announced the following standing committees:

To fill the vacancy on the Executive Committee, E. E. Hughes, Des Moines.

Membership Committee.—A. R. Bgeun, T. L. James, W. H. Baird.

Publication Committee.—J. B. Monfort, A. Morseman, T. A. Hallett.

Adjourned to meet in Des Moines the first Tuesday, in May, 1885.

J. B. MONFORT, Secretary.

Owing to the failure of the stenographer to transcribe the discussions, the most interesting part of the proceedings of the Iowa State Dental Society is necessarily omitted.

THE TWENTIETH ANNUAL MEETING OF THE ILLINOIS STATE DENTAL SOCIETY.

Reported Expressly for the ARCHIVES OF DENTISTRY.

[CONTINUED FROM PAGE 304.]

THURSDAY AFTERNOON SESSION.

The society reassembled at 2 P. M., and Dr. Wm. H. Taggart, of Freeport, was announced to read a paper on Chemistry. The speaker had a small laboratory on the rostrum, and illustrated every point presented with practical experiments in view of the audience. Among other demonstrations was the manufacture of a quantity of "sulphuretted hydrogen" which he passed about the room naively assuring those present "there was smell enough to go round;" an assurance that was entirely unnecessary in view of the pungent odor that freely distributed itself throughout the Senate Chamber. The experiments were observed with much interest, and there was, incidentally, some colloquial remarks passed between the lecturer and audience.

He alluded to the necessity of using pure substances and mentioned the common impurities of carbolic acid and creosote. Carbolic acid is soluble in glycerine while creosote is not. By this test they can easily be distinguished. There were other tests mentioned but this simple one is sufficient. Both carbolic acid and creosote are disinfectants but in a very slight degree. Zinc chloride is a good disinfectant.

In his remarks on amalgams he mentioned an experiment he had made using an amalgam plug that had been worn in the mouth 42 years. When tested for mercury, it was found to give off mercurial vapor just as actively as a similar amalgam filling that had been in the mouth only 24 hours. These tests were made at various temperatures; even as low as 10° below zero, the vapor was still exhaled. His experiments with arsenious acid were of a very interesting and useful character. In one case he placed this substance in a cavity in a tooth in the same way that is usually practiced for devitalization of the pulp. Allowed it to remain in the cavity two days. It was then removed and the decay cleaned out and the cavity left open two weeks. At the expiration of the time the pulp was removed and arsenic was tested for and found not only in the bulbous portion of the pulp, but also the slender portion taken from the root canal.

He also exhibited a piece of alveolar process which had been destroyed by the careless use of medicine. On testing this piece it was found to contain arsenic.

Dr. Taggart described his method of preparing ox. phos. of zinc. For the liquid he dissolved glacial phosphoric acid in a considerable excess of water, then by the careful application of heat evaporated the solution to the consistency of syrup.

For the powder, pure zinc oxide was brought to a white heat and this degree of heat maintained two hours. A portion of borax, glass or silica, finely powdered, is by some added before calcining.

Dr. E. S. Talbot, of Chicago, was appointed to open the discussion, and, like the lecturer,used the blackboard somewhat freely in his equations and illustrations. He said, if we are to make any improvement in dentistry, chemistry must be mastered and that whatever discoveries were made in this direction must be made in the laboratory or through the microscope. Dr. Taggart's experiments were very interesting and important, and his reference to carbolic acid impurities, should be especially heeded. The necessity for pure carbolic acid could not be too often emphasized, for if an impure article is used disastrous results may follow. If we use carbolic acid for creasote, or vice versa, some hazard is incurred.

"If for any purpose we wish to coagulate albumen in the tooth, we must at the same time prevent its decomposition. Carbolic acid does this. I do not consider carbolic acid a disinfectant, but it is an antiseptic. A disinfectant is something that unites with the odor and forms a new substance."

"I give oxy-chloride of zinc a preference for filling root canals, for the reason that it has chemical as well as mechanical properties. Gutta percha has only mechanical properties and is therefore inferior for that use."

Dr. Taggart's tests showed that arsenic had been absorbed into the tissue of the pulp. If it is absorbed it must be in liquid form. We are taught that arsenic destroys by over stimulation of the circulation. Dr. Taggart takes a different view, and perhaps he is right.

He was glad that the doctor had shown us how to make the oxyphosphate of zinc; for his own experiments, and he thought perhaps those of many others, had been the reverse of successful.

Relative to the acid theory of decay, Dr. Watt in 1883 advanced the theory that nitric acid produces white decay and that black and other decays were produced by other acids, but the speaker vigorously combated this theory.

He stated that in health pure saliva was alkaline and the mucus secreted by the mucous glands was acid. An alkaline reaction of mixed saliva is abnormal, yet in the mouths of children where the condition exists, decay of the teeth often goes on rapidly. Believes the acids in the mouth are too dilute to act upon the teeth.

Dr. Black.—This question is very interesting, but time presses and I will allude to one point only. It is a difficult point to make, and one more difficult to understand. I allude to the confusion of the terms disinfectant and antiseptic. They are often used interchangeably and erroneously. Let us, if we can, entirely put aside the confusing terms, as popularly used, and consider these propositions:

First, we have a substance that destroys odors by uniting with them.

Second, we have a substance that prevents the formation of odors.

Third, we have a substance that destroys the life force, so that in future there is no odor.

Number one if thrown into odoriferous matter, by a chemical action destroys it. Number two kills the action of the force. Now, number one has been called a disinfectant; number two, an antiseptic, and number three is a parasiticide—a destroyer of parasites.

Dr. Spalding.—Is there such a thing as destruction of life force?

Dr. Black.—The action is mysterious. We use the term precisely as we use the term death; but we know not precisely how the destruction is effected.

Dr. Black then read a brief but comprehensive paper entitled, "Specialists and Specialties," setting forth the need of specialists and their exalted mission in life. All vocations of life were in their nature specialties and could be rendered successful in the fullest sense only by specialists. The pleading of law, in its various branches, comprised a specialty, or rather an aggregation or combination of specialties. Singing, preaching, and praying were specialties, each of them. Men who built railroads and telegraphs were specialists, and so were those who operated them. The practice of medicine is a specialty and dentists, too, are specialists. Those who adapt themselves to a special vocation in life and pursue it faithfully and intelligently were the specialists of the age. The names of such men went down in history as those who honored their calling. The speaker presented the incentives to renewed industry and discovery in dental science, and concluded with an exhortation to continued diligence in the practical domain of dentistry—a specialty worthy the utmost devotion.

The highly instructive paper was awarded the merit of universal approval and was discussed as follows:

DISCUSSION.

Opened by Dr. George H. Cushing.

Dr. Black, in his paper, has expressed much better than I could have done what I should have wished to say. In fact, he has stolen my thunder! Still, there are a few points which it may be well to emphasize. It is the tendency, in all specialties, for men to run in groves. This is a grave misfortune, and should be most earnestly combated. Without those comprehensive views that regard the individual organs as only parts of the whole system, each intimately associated with all the others, we cannot hope to attain that degree of excellence that can only belong to the true professional man.

Aside from this comprehensiveness, in a strictly professional sense, the true professional man should be as broad in his culture as his intellectual capacity will admit—for such breadth of culture is an immense aid to that breadth of professional view which, I have said, is so essential to the highest special training. The essayist in his paper gives evidence of this broader culture. I do not say this in flattery, but because I could not have a better exemplification of the value of such culture than is furnished by his paper.

[TO BE CONTINUED.]

CHLORATE of potash is in common use as a remedy for sore throat, sore mouth, etc., among the people who believe that "if it does no good it can do no harm." This is a dangerous error. The Philadelphia *Medical Times* reports a case of a muscular man, aged 40 years, who died as a direct consequence of taking about 150 grains of this salt. Many similar cases have been reported.

SOUTHERN DENTAL ASSOCIATION.

SIXTEENTH ANNUAL MEETING, HELD AT LEXINGTON, KY., MAY 6, 7, 8 AND 9, 1884.

Reported Expressly for the ARCHIVES OF DENTISTRY.

(Concluded from page 317.)

AFTERNOON SESSION.

The Executive Committee recommended Dr. A. Wilks Smith, of Richmond, Ky., as and active member, and he was duly elected.

PATHOLOGY AMD THERAPEUTICS.

Dr. A. O. Rawls, of Lexington, Ky., said there was enough to say, if discussion could be called out, on mooted questions. He trusted those present would express themselves on conservative dentistry. There were many things said about operative dentistry, without any consideration of the principles of physiology or of pathology. We hear very much of bridging, crowns, etc., but many operations are never looked into as far as they concern the laws that govern those parts on which they are placed. So with regard to whatever kind of appliances goes on the teeth. How many of us understand, or seek to understand, the effect when we place an inorganic material on an organic body. We know there is want of harmony. There is a difference between the adoption of merely mechanical means and their adaptation to those tissues which are to sustain them.

He desired to call attention to that bugbear—so-called because it is not understood—the etiology, pathology, and means of cure of the disease *pyorrhea alveolaris*. Dr. Black has stated that the etiology has never been understood. Only when we comprehend the causes of any disease, and not till then, can we hope to effect anything absolutely curative. About the first knowledge of this disease that came into the journals, expressed by an intelligent body, was from the Connecticut Valley Dental Association. Then followed the American Dental Association with a paper giving the expression of that association at Chicago. At that time there were two contending parties. One believed it was simply a local disease; the other that it was a constitutional trouble, with a local expression. In Chicago, in 1875, Dr. Rehwinkel read a paper, in which he held that this disease is constitutional, that it has its existence in a certain diathesis. It is the same as a susceptibility to glandular diseases, as in scrofula—the same as in rheumatism in an overstrained body. The periosteum is susceptible a long time before the disease shows itself. He (Dr. Rawls) had stated his views, and had the support of Dr. Rehwinkel and several others—that the disease is constitutional, with a local indication. It invariably follows the use of mercury. It is transmitted from parent to child even to the third generation. The same conditions were present among sailors, till they began to be fed on desiccated vegetables. The conditions of the disease were the same conditions as those arising from the use of salt meats. It is of the same nature as scurvy, but is not the same in the general system. Similar conditions are found where tomatoes are largely used; canned tomatoes especially. It is well known that mercury acts upon the liver, and that tomatoes act exactly in the same way, though with less effective results. It will be found that with tomatoes the same results can be produced as with mercury. He knew of but one common constituent in salt, mercury (calomel?) and tomatoes, and that is chlorine; therefore he concluded there must be some combination into which it entered to produce an influence on these peculiar tissues. When scurvy affects the body, it does so from the periosteum. Scurvy is produced by the use of salt meats. He believed the disease has its inception in the periosteum from any local irritation. There are two obstacles to curative effects. Whenever this disease attacks a tooth it is denuded of its membrane, and there is no possible chance of restoration and re-connection till these parts are thoroughly protected against the effects of any physical or chemical irritation. He believed such protection impossible. When the disease has progressed to any great extent, every bit of the gum is loosened round the neck of the tooth. The secretions of the mouth, alone, act as irritants. In cleansing away these irritants, there is a washing away of the secretions that go to build up the tissue. He had heard it often said, especially by one man, that this disease is curable; but he had a patient who had been treated for years by this man, and the disease is still existent. An improved condition of the gums might be secured, but the only way of cure, he fancied, was to remove all sources of irritation, not only remove the tartar, but cut away the diseased tissue. The difficulty was to reach to where the circulation was perfect. After the operator had done all he could with his instruments, he would be simply waiting for the disease to take hold of the other parts. He had heard of different medicaments, of antiseptics; but they do not radically cure the disease. They only stop the further action of the irritants.

Dr. W. H Morgan disagreed with Dr. Rawls in the axiom:—that no disease can be cured till its causes are understood. The disease treated by dentists every day, caries, was an instance. Its causes were not known. They all had their theories, and held differently, but treated them much alike. The germ diseases were not understood, such as small-pox. They were treated from the standpoint of the germ, but it was not known what the germ is, or how it exists. It is the same with malaria. Its causes are only an hypothesis. He did not know that he understood the gentleman as to the use of mercury when he stated the disease invariably followed such use.

Dr. Rawls explained that he meant to make plain that the disease followed the use of mercury, or of the other two substances he had named.

Dr. Morgan had known the disease where there had been no mercury.

Dr. Rawls.—"Or salt?"

Dr. Morgan.—Didn't know about salt. He agreed with Dr. Rawls on most other points. The disease had an appearance as if mercury had softened the tissues. It was sometimes found in persons in very robust health. Mercury acted not only on the liver, but also on the corpuscles of the blood, breaking down the red ones and destroying the white. He had no doubt it was a curable disease. Not that the broken down parts could be restored, but that the surrounding parts could become comparatively healthy. The bone could be restored to health. He thought it would puzzle the gentleman to show any roundy circulation in the body of a tooth of an animal. It was a fair inference, but it could not be proven. Whenever we begin to speculate, and get beyond the reach of the microscope, opinion can't be relied upon in the treatment of tissues. In this disease the idea is that when the soft tissues are broken and removed, nature throws out protoplasmic matter to restore the loss. He believed the new tissue less liable to disease than that originally there. Scar tissue has less sensation than the original. He believed many cases were constitutional, but caused by local irritation. A predisposition may remain in the system. Sometimes the whole system is affected, as is seen in connection with neuralgia, which often extends through the whole system, at least down to the lumbar vertebræ. Even when there are no indications beyond those of local character, systemic treatment is well.

Prof. Taft.—Was not clear as to whether the systemic condition favoring this disease was a peculiar condition, or only some form of enfeeblement or inability to be well nourished. If Dr. Rawls' theory were correct, all that need to be done was to avoid mercury, salt and tomatoes. He supposed that theory was based merely on observation.

Dr. Rawls.—"A series of observations?"

Prof. Taft held that the observation, as to chlorine, was merely theory; as to the vegetable alluded to, inferential. When there is a predisposition to this disease, it seemed to him all that was necessary was strengthening. Some think that the causes are all local, and if you take away the irritants, all will be well. This has been done in some cases with good results. It would be well, probably, to treat the system in this as in any other local affection. As to the cause of the disease, there were various opinions. Some thought it was merely local, and had so treated it; peroxide of hydrogen, or iodide of zinc, being used, it was said, with marked success, by destroying the organisms affected. Aromatic sulphuric acid produced good results, and affected a cure, so far as regarded the progress of the disease. As to the duration of new tissue, it had been observed that the secondary tissue, formed after the replantation of teeth, often maintained its integrity an indefinite length of time. At other times it lasted only a little while, taking on disease and breaking up. There was great variation in diseases of the gums. Sometimes there was loss of tissue, at other times there was enlargement of the gums. The treatment must be modified. Study should first be made of the local and general aspects, then there should be investigation of the modes of meeting the different phases. He was somewhat in doubt as to heredity of mercurial taint. When one becomes deteriorated, the progeny will not be strong; but he doubted whether a positive mark could be transmitted.

Dr. Rawls held that if we believe in the transmission of a single physical quality, we must believe in the transmission of mercurial taint. Consumption is hereditary; scrofula is hereditary. In these the transmitted molecules are similar to those of the tissues of the parent. We don't know that the mercury is carried along; we have no right to believe that; but we have a right to believe that its effect upon the tissues is transmitted in accordance with the peculiar surroundings of parent and child. We know there must be a roundy circulation in the teeth, in spite of what may be said against it. There must be a round of circulation or a clash of affinities. In some way there is a flow and a return.

Prof. Taft admitted the transmission of constitutional peculiarities—those of static character; but those of an accidental nature are not transmitted, such as the loss of a finger, or the loss of part of a tissue. If inherent, it will be; but if accidental, it will not. The mercurial condition is only accidental.

Dr. F. Peabody, of Louisville, Ky., agreed with Dr. Rawls in the transmission of the disease. He had seen in mother, son and daughter the disease in the same tooth. The theory, as to mercury, might be correct; but, if so, it was more from the dying out effects than the positive effects.

Dr. Rawls.—Agreed.

Dr. Peabody argued that much mercury was given years ago, all through this southern country. Then the disease was not known; but now we see much of it. He believed it was a systemic or "blood" disease. He didn't think the tomato a responsible agent in the matter. Though it resembled scurvy, vegetable acids would cure scurvy. He believed it was systemic, but confined to the periosteum of the tooth. The tissue was destroyed to the periosteum, but that was intact. Those who had treated the disease, had removed the necrosed edges. It was noticeable that when the teeth were removed, the gums did not hesitate to close over the part. He did not approve of the taking away of bone tissue, as the chances of its return are exceedingly doubtful.

Dr. Rawls argued that, when the teeth are taken out, all the time the socket is healing, there is disintegration of the bone, and the cast-off particles have an exit through the opening, the tongue, action of food, and the lips help them out.

Dr. Patrick stated his experience to be that when the disease had not progressed too far, cleanliness was the best thing. He considered it local, and not constitutional, though the anatomical form of the teeth and alveoli might be hereditary, and this makes certain teeth more liable to disease. All the successful treatment he had heard of had been local. Those treating the disease called it a constitutional affection, but treated it locally. The transmission of disease was questionable in any case. There were some conditions of body in which more lime was secreted than others. Thus far this disease might be constitutional in the deposit of tartar. He had never found satisfactory proof that it was in the blood.

Dr. Morgan did not hold that disease itself was transmissible, but that a predisposition of a part to take on disease was.

Dr. Taft asked if that was not true of all tissues.

Dr. Morgan supposed it was. A person with a predisposition to consumption may die with or without the disease,though the predisposition is there, and will show itself undr favorable circumstances. He doubted that pyorrhea alveolaris is more prevalent now than it was thirty or forty years ago. If so, it is because there is less mastication of food. Friction was the best treatment of all. There were very few cases of necrosis of the alveolar process. There were many cases of disease of the bone, but few of positive necrosis.

Dr. Patrick referred to six persons of a family, all with fine and perfectly white teeth, while other members of the same family, living in the same section, and apparently in the same circumstances, and all healthy people, had teeth that, though good, were literally rusty. He couldn't account for it. When there is a great accumulation of salivary calculus there is never stone in the bladder, and *vice versa.*

Prof. Smith, of Cincinnati, considered that peroxide of hydrogen was not the thing to use in such a disease. Putrefaction requires free oxygen. The bacteria feed on pure oxygen. After referring to certain experiments in proof of this, he argued that oxygen was the wrong agent. He agreed that cleanliness was the best remedy. The germ might begin in the infant when nursing, as from a filthy nipple. The anatomical relations of the teeth may be the same in parent or child; then the results will be the same.

Dr. A. W. Smith, of Richmond, Ky., expressed the probability of the disease being caused by what might be termed accidental constitutional causes. The Mississippi Valley Dental Association had investigated this matter,and found the disease in both the limestone and the miasmatic regions. It was also noticed that women, with perfectly healthy teeth, after nursing become subject to a general breaking down, and this disease appears. Many diseases follow a general weakening. Neuralgia is never seen in a strong, healthy man.

Dr. A. Berry, of Cincinnati, said this was a common disease, now and formerly. It occurred in persons otherwise healthy, and was too often neglected. If the patient had not the fortitude to stand heroic treatment, he had better be let alone.

Prof. Smith desired to speak further on nursing. Since he had taken his seat a book had been placed in his hands. [It was the *Independent Practitioner.*] In it he found a paper by Dr. Miller, of Berlin, Germany, on fermentation in relation to caries of the teeth, in which lactic acid was referred to as an agent. Now, if lactic acid ferment be a cause of caries, why not of *pyorrhea alveolaris*? His attention had been called first to the probability of disease arising in the mouth of an infant by seeing a very filthy mother suckling a child. It was well known that many mothers were very careless in regard to the cleanliness of the nipples in nursing, and this might easily be the origin of disease of the teeth.

Dr. Rawls, Chairman of the Executive Committee, announced that invitations had been extended to the Association to visit the farm of Major H. C. McDowell, "Ashland," the house of Henry Clay, and also the farm of Mr. J. C. Alexander, "Woodburn," in Woodford County. Arrangements had been made to drive to "Ashland" in the morning, return and hold a session, beginning at 10 o'clock; and in the afternoon, go by train to Spring Station, visit "Woodburn," and return in the evening.

THIRD DAY.

The Association visited "Ashland" in the morning, and being invited also to visit "Ashland Park," the farm of B. J. Tracy, an extensive horse-breeder, the members spent the entire forenoon at these two places. Failure to catch the train prevented the visit to Alexander's farm in the afternoon, but no session was held during the day.

EVENING SESSION.

A communication was read from Dr. R. Finley Hunt, Secretary of the National Dental Association, announcing its fourth annual meeting in the lecture room of the U. S. National Museum, on the fourth Tuesday in July.

ELECTION OF OFFICERS.

The Association then proceeded to the election of officers for the ensuing year, which resulted as follows:

President, Dr. A. O. Rawls, Lexington, Ky.; 1st Vice-President,

W. R. Clifton, Waco, Texas; 2d Vice-President, T. S. Waters, Baltimore, Md.; 3d Vice-President, B. H. Catching, Atlanta, Ga.; Corresponding Secretary, J. L. Fountain, Bryan, Texas; Recording Secretary, R. A. Holliday, Atlanta, Ga.; Treasurer (re-elected), H. A. Lowrance, Athens, Ga.

THE NEXT MEETING.

On motion it was decided to hold the next annual meeting in New Orleans, on the last Tuesday in March, 1885, to which time the society adjourned.

MINNESOTA STATE DENTAL ASSOCIATION.

The Minnesota State Dental Association held its first annual meeting in St. Paul, commencing July 16, and continuing three days.

The officers for the ensuing year are as follows:

L. W. Lyon, St. Paul, President; T. A. Williamson, Red Wing, Vice-President; H. L. Cruttenden, Northfield, Secretary; J. H. Martindale, Minneapolis, Corresponding Secretary; A. T. Smith, Minneapolis, Treasurer.

Executive Committee.—H. M. Reid, T. E. Weeks, H. A. Knight, C. E. Hale, J. L Jacobs.

Membership Committee.—C. H. Goodrich, W. H. Crary, J. E. Miller, I. C. St. John, A. M. Dixon.

Next meeting to be held in Minneapolis on the 3d Wednesday in July, 1885.

H. L. Cruttenden, Sec.

Sticking Wax.—Dr. C. R. Bulter gives this formula :

℞	Gum damar, - - - - - -	℥vij.
	Bleached beeswax, - - - - -	℥jv.
	Canada balsam, - - - - -	ʒj.

While operating, if you happen to knock a hole in the rubber dam, raise it up and stick a piece of paper over the hole with the wax. Where it is impracticable to apply a clamp, push the dam well up against the gum, dry the tooth, warm and apply a small piece of the wax against the tooth and dam. This wax will be found useful also in adjusting gold and porcelain crowns, attaching single teeth to trial plates, etc., especially in warm weather.

JOURNALISTIC.

"Reading maketh a full man; conference, a ready man; and writing, an exact man."

The Higher Education by Dr. J. D. Moody is the first article in the July number of the *Ohio State Journal of Dental Science.* The paper was read before the Central Illinois Dental Society. This is a question that is occupying the minds of all intellectual persons. The ladies have their clubs where they meet and study, perhaps, some language—an author's works, or anything which may tend to give them a higher intellectual training.

Professional men should be able to be teachers in this great work of educating the masses in Higher Education. He says: "We have not been accorded the scientific and intellectual position after which we have been striving; and perhaps for this reason, this state of unrest which promises future progress, is more appparent in our profession than in any other. From the gradual advance that is being made we have reason to hope that, sometime in the future, ours will truly be one of the learned professions; and learned not in the sense that it *professes* a high standard, but in the fact that the rank and file *possess* this high standard." * * * "We claim to be a learned profession; and yet our average dental student begins the study of his profession at the same mental point at which the ordinary college student begins, but the preparation for the study of some profession."

"I have shown that the average graduate on entering upon his work, drops all but finger education and in no sense is a learned man. So it always will be. It is only by the untiring efforts of the few, who, endowed by nature with qualities of leadership, can by force of example or precept, raise the standard of our profession; and, in a measure, keep the masses up to that standard." * * * "I believe every professional man should have some hobby outside of the strict line of his work. It should be something upon which he could expend all his spare energy of body and mind, and something to which he could go for recreation. It should follow the bent of his mind, be it either mechanical, or chemical, in botany, zoology, entomology, geology, electricity, or in fact, anything; only so it will act as a support to the mental powers."

A change of brain effort, from bread winning to pastime, brings to light a marvelous provision of nature to prevent either a stagnation or a total break down." * * * "Wearied and perplexed with the cares of a day in the office, well nigh broken down, both in body and mind, go out for an hour's butterfly hunt, or to look for some rare plant which you believe to be hiding near by, and see how quickly all is changed. The tired muscles are forgotten—in fact are tired no longer—and refreshing sleep follows with its healing virtues."

Antisepsis.—By G. S. Junkerman, M. D., D. D. S., read before the Cincinnati Dental Society. "The term sepsis means putrefaction. Putrefaction is the splitting up of an organic body into its element, not elements in the sense of *simple* substances, but bodies which,by their less complex composition, are more tangible." * * * "Septic poisoning is merely that condition caused by the absorption of the chemical products of putrefaction." * * * "Koch claims that he has found the peculiar bacteria, the rod-like bacteria of putrefaction, being the one always found; but when septic infection is present he finds a round bacteria which is capable of great multiplication, and is of great tenacity of life. The rod bacteria are very short-lived, and are not capable of long endurance and multiplication in the human body. There is no doubt that decomposition favors the formation of these round bacteria by forming a suitable soil for their propagation; but decomposition can exist without them.

"Whether they can exist without decomposition is still a debatable question."

"From this can be drawn the conclusion that, if you prevent decomposition, you, at least, take away a great predisposition to septic infection, or the formation of true septic germs."

Rapidity of action, efficiency, and the absence of bulk, are qualities highly sought for in severe indications for the antiseptic treatment. This fact has been but lately recognized. The bichloride of mercury, one of the strongest parasiticides, and one of the most violent corrosives, has fallen into favor from the recognition of this requirement. It is now used by many surgeons for external purposes $(\frac{1}{1000})$ by oculists $(\frac{1}{5000})$." * * * "Bichloride of mercury being a strong corrosive, cannot be used in full strength against any of the soft vascular tissues. A very concentrated solution of this salt cannot be made—five grains in three ounces of water $(\frac{1}{300})$ being a saturated solution. Water will, however, hold in suspension considerable more than this. I have succeeded in making twelve grains to three ounces, or four grains to the ounce, disappear, but if allowed to stand the excess in the solution will sublime.

"This is the antiseptic that dental surgeons should use." * * "The *creosote doctor* must go. Persons of refined taste will not permit this drug to be used upon them. I have had people tell me that they had tasted nothing but creosote for three months after using it * * and it is not only distasteful, but unsuitable to be used in the mouth."

"The science of internal antisepsis is in its infancy. We look forward for the time when each disease and its germ shall be identical. The human body, which is but the home of these diseases, will be the vessel into which the remedy must be poured to produce a neutrality of the diseased condition."

Editor's Specials.—Judging from the editorials in this number, we may congratulate the editor and ourselves upon his recovery from a recent illness. There is a great amount of valuable information in "*The Physiological Battle*," the first editorial. "In naming this article, the battle reference is to the contest between vitality and affinity; and there is no allusion to a controversy between parties holding different theories."

"*The Salt of Salts*"—(phosphate of lime) is the second editorial. "It is so often claimed that the salt is nearly inert as a medicine, on account of its insolubility, that 'line upon line' is necessary in counteracting the error. Those who speak of its insolubility, as Pereira and others, usually, in the same paragraph, tell us that it is highly soluble in hydrochloric, acetic and carbonic acids, substances nearly always found in the stomach." * *. * "It has been our habit in such cases to prescribe the phosphate generally in the shape of foods abounding in it, as lean beef, cracked wheat, whole grain flour, the meat of domestic fowls, etc., but often we have suggested the addition of the pure salt to food. For children, we suggest a pleasant syrup of the lacto-phosphate of lime, as it is not difficult to induce them to take it in that form."

The First Permanent Molar and its Early Management, by J. Hardeman, D. D. S., appears in the *American Journal of Dental Science*, having been selected from the *Dental Luminary*. In concluding the article he says: "The plan of removing the entire four molars, where one is past salvation, in order, as it is claimed, to secure and maintain perfect articulating antagonism, is, in my view, bad physiology and reprehensible practice. By close observation in hundreds of cases where but one molar of a jaw was removed, we have found nature come to the rescue, and with such complete restitution, that we can but regard the wholesale extraction of sound teeth in this case, and *alone* for this purpose as erroneous and ill practice.

"And, finally, my observations force me to the conclusion, that capping the pulp by any approved plan will prove a failure in this tooth any time before the third molar is developed. And if the pulp is devitalized, no mode of root or crown filling, along with the best therapeutic treatment, will carry the tooth even to adult age, and then be worth one-half what it cost in suffering and disappointment. And if enduring perseverance has it in possession at this age, ninety-nine chances to one, it is more or less a nuisance, and will not be tolerated but a limited period, and then its removal will be followed by a permanent gap, and very certainly an imperfect third molar."

PEROXIDE OF HYDROGEN.

The *Southern Practitioner* gives as a selection from the *Sanitary Journal*, an article on this remedy:

"This substance first discovered by Thenard in 1818, is remarkable for the facility with which it gives up half its oxygen; which property constitutes it a powerful deodorizer and disinfectant. * * * This substance, in vaporous form is produced in enormous quantities, by atmospheric oxidation of the essential oils volatilized into the atmosphere from pine and eucalyptus forests. 'Its production is accompanied with that of thymol, a soluble camphor, and several other substances which in their collective capacity constitute the active principle, to the presence of which substances in the atmosphere is to be attributed the health-giving properties of the said forests.' It is generated spontaneously and is given off by many substances in common use, such as the essential oils—as of turpentine, lavender, wintergreen, etc., and even the expressed oils and fats, by nearly all perfumes, including those given of flowers, by gasoline and benzine, and by certain kinds of wood. In connection with this it is a remarkable and an interesting fact that men and women, from the highest to the lowest, in every part of the world, appear to possess an instinctive desire for the use, in one form or another, of these substances which generate this purifying principle. * * * "There can hardly be any doubt that the use of such substances is promotive of health. A solution of peroxide of hydrogen is used in surgical practice as an antiseptic, and the readiness with which it yields oxygen is well represented by its action with pus in ulcerating wounds, completely obliterating the pus cells. The *Medical World* says: 'As a disinfectant for the sick-room it probably has no equal. As a bleaching and cleansing agent, and as an article for the toilet, it is very useful.'"

Origin, Progress and Present Status of Dentistry. By J. C. Johnston, D. D. S. Read before Alabama State Dental Association, and published in the *Dental Headlight.*. The paper was written by request of the President of that Association, to stimulate public interest in the vast importance that our specialty pertains to the general good. Regarding that very important subject, Children's Teeth, he says: "The idea is too prevalent, that children's teeth are only temporary, and consequently are not worth saving. Oh, how we murder the innocents, or suffer it to be done. If perchance they are suffering with that terrible pain that Burns so vividly portrays they are at once greeted with the consoling admonition, 'shut right up,' or I'll take you to doctor so and so, and have every tooth in your head taken out.

"How foolish! This should not be so. Confidence should be instilled in these younger patients, that they may recognize the importance of the preservation of their teeth. Nature does a great deal, but sometimes she needs assistance. A very little at the proper time will often prevent serious trouble. If the temporary, or deciduous teeth, are preserved until nature indicates their removal, often a malposition of the permanent ones is avoided. I know that some contend that premature extraction does not contract the jaw. I readily concur with them, if the jaw-bone proper, is referred to, but do not if the alveolus is included. That is a distinct formation, and whenever a tooth is removed, whether from a child or adult, the process absorbs—nature abhors a vacuum, the arch is lessened, hence there is not room for dental replacement. It is maintained by some—and eminent men, too, of the profession—that extraction of the temporary teeth does not create sufficient contraction of the alveolus to produce irregularity either in the period, order of eruption, or in any way interferes with the arrangement of the permanent set. My own convictions and observations are not in accord with such views."

The Southern Dental Journal, May.—The first article—THE RUBBER QUESTION continued. The rubber seems to be getting the better of the battle, with the exception of the red variety. In 1874 the St. Louis Dental Society unanimously recommended celluloid; now it is seldom used, and most of the plates made of it have been replaced by rubber.

The New York Times—A New Fashion.—To all wearers of false teeth the news of the recent fashion set by a Chicago society lady will be extremely welcome. This lady has an entire set of false upper teeth, and she neither conceals the fact nor pretends that they are preferable to real teeth. She is also near-sighted, and wears suspended to a hook on the northwest summit of her dress a pair of neat eye-glasses which she puts on whenever she wishes to look at anything. Some time ago it occurred to her that it would be the part of common sense to use her teeth only when she desired to talk or eat. Accordingly she now carries them suspended by a cord around her neck. When she meets a friend she first puts on her eye-glasses and looks at him, and then puts in her teeth and indulges in conversation. Similarly, when she goes to dinner she puts in her teeth as soon as the soup has disappeared and the fish is brought on. Being a leader of Chicago fashion, her example has been followed by other ladies, and at a Chicago opera quite a large proportion of the audience wore their teeth gracefully suspended from the neck. H.

PROSECUTION OF A DENTIST.—*The British Journal of Dental Science* of April 15 says: An American lady brought an action against a Riverside dentist for injuries sustained at his hands whilst he was performing a dental operation. The injury complained of was a cut inflicted upon the young lady's tongue; the damages were fixed at $9,000. The jury found for the defendant. It is proverbial that "there is many a slip." A case of this sort brings home the lesson of how cautious all operators should be.

BRAIN work should not knit the brow, strain the eyes, or give any other token of tension which is friction, says the *Lancet*. The best brain work is done easily, with calm spirit and equable temper and in a jaunty mood. All else is the toil of a weak or ill—developed, brain straining at a task too great.

MISCELLANY.

CAN HUMAN BLOOD BE TOLD FROM THAT OF THE DOG?

In a recent case on trial at Wellsboro, Pa., Dr. Thad. Up de Graff, of Elmira, N. Y., swore very positively on this point. The newspapers give Dr. Up de Graff the credit of convicting the prisoner. It is not the proper place here to determine whether the prisoner was guilty or not ; it is within the province of this journal, however, to determine whether the expert testimony was according to facts. Dr. Up de Graff was given some of the stained clothing to examine, and by processes entirely unknown to the writer (according to all accounts seen), by decantations, washings, etc., some corpuscles were produced and measured. Dr. Up de Graff positively testified that this was human blood and not dog's blood. When asked if he was the only one who could tell this, he replied that "there were but *four* men in the world who could tell human blood from dog's blood;" and of course he was one of them. When asked why he could do so much better than others, the reply was, " On account of the superior character of his glasses, and that his microscope cost sixteen hundred dollars." The testimony of Dr. Up de Graff makes him give a positive size to the human red blood corpuscle. What do standard writers say on the subject?

Gulliver says they are the $\frac{1}{3200}$ of an inch.
Flint says they are the $\frac{1}{3500}$ of an inch.
Dalton says they are the $\frac{1}{3731}$ to $\frac{1}{3050}$ of an inch.
Richardson says they are the $\frac{1}{3378}$ of an inch.
Woodward says they are the $\frac{1}{3092}$ of an inch.
Frey says they are the $\frac{1}{2840}$ to $\frac{1}{4630}$ of an inch.
Welker says they are the $\frac{1}{3230}$ of an inch.

Where is the exact size to judge by? The red corpuscles are also subject to change in size by the varying changes in the blood and by many drugs. Wagner, in his General Pathology, gives a long list of remedies that when administered change the size of the corpuscle. How delicate it is, also, to the various reagents used in microscopical work! I have seen red corpuscles as small as $\frac{1}{5000}$ of an inch. I have never measured red blood corpuscles in lots of fifty each and had any two exactly alike, although using a delicate cobweb eye-piece micrometer and a one-fiftieth objective.

Listen to what Dr. Woodward, of Washington, says: "The average of all the measurements of human blood I have made is rather larger than the average of all the measurements of dog's blood. But it is also true that it is not rare to find specimens of dog's blood in which the corpuscles range so large that their average size is larger than that of many samples of human blood."

Human blood cannot be told from dog's blood, except under favorable conditions, and not invariably then; for the sake of microscopy it is a pleasure to know that only *four* men are ready to make such statements. There are a score of men in this country with glasses equal at least, to Dr. Up de Graff's, who would testify directly opposite to him on this point. If Dr. Up de Graff is ready to receive a number of pieces of cloth, labeled and stained, respectively, with human and dog's blood. under favorable and unfavorable circumstances, this journal will see to it that said cloths are prepared with accuracy by competent parties. If he succeeds he shall receive all the glory these columns can sound forth, but if he fails he will be referred gently to his Wellsboro testimony.—*Microscope.*

CAST METAL PLATES.

BY L. P. HASKELL, CHICAGO, ILL.

For the lower jaw it is undoubtedly true that a "cast metal plate" of Watt's, Weston's or Reese's metals is the best method for a majority of cases, especially where, as is often the case, the absorption has been so great as to leave nothing but a thin shallow ridge of membrane, always more sensitive than the upper jaw, and which has, in a measure, to adapt itself to the plate.

By this process there is insured a better fit than can be obtained by any other method, for it is cast to a non-shrinking model of plaster and pumice, or sand, or whiting. (I prefer the former).

It is often, in this class of cases, that plates have to be filed to relieve irritation; with this work it can be done without marring its appearance.

I like the method of casting the plate to a pattern formed of sheet wax, the edges doubled all around, so that, when finished, it has the appearance of a band, as the rubber is finished flush to that edge. Then file and partially finish, try in the mouth, and cut away where necessary; spur the surface with a sharp graver, and attach the teeth with pink rubber.

PLASTER OF PARIS SPLINT IN FRACTURE OF THE JAW.

On the nineteenth of last September, Jno. R., aged thirty years, a huckster by profession, was quietly riding one of his mules to water when suddenly, such is the uncertain temper of that useful domestic animal, the mule jumped, bucked and threw him, winding up the circus by landing one hind foot in the prostrate rider's face. The man was carried into the house, and I was called in haste to attend him. Upon examination, the lower jaw was found to be broken on the left side just in front of the last molar tooth, a simple transverse fracture. The usual Howe splint was applied, but there was a troublesome slipping in of the anterior fragment of the broken bone which it was impossible to overcome with that splint. After trying several other varieties of splints with no better success, a plaster of Paris splint was put on in the following manner: Some fresh plaster was obtained, which was mixed up with water in a glass tumbler, a small quantity of salt was added to facilitate hardening. As soon as the plaster began to stiffen up a little it was poured into a muslin chin cup and applied to the entire lower jaw, over which a thin cloth had been put to keep the plaster from direct contact with the skin. The fracture having been reduced, the plaster was held firmly in place until it hardened. This splint accurately fitted the jaw, made a hard firm chin-piece which was held securely in place by a leather chin cup with appropriate straps and buckles, constructed by an ingenious shoemaker. Teeth were luckily missing in the right place and the patient was fed on liquid food through a tube. There was no more slipping. The splint was allowed to remain without change for three weeks, when upon the patient complaining of it feeling heavy and uncomfortable, it was removed and a lighter one of the same material and in the same manner was substituted. This was worn for ten days longer, and then removed, the leather chin cup being continued a week or so. The result was all that could be asked, and there is now no evidence of the jaw ever having been broken.

There is nothing particularly new in this case except the application of the plaster of Paris, which I never heard of being applied to this particular kind of fracture.

One extraneous fact in this case is that the patient was cured of a confirmed dyspepsia by the enforced six weeks liquid diet.—*Lyman Watkins, M. D., Blanchester, Ohio, Eclectic Med. Journal.*

ANOINTING IN INFANTILE DISORDERS.— SCARLET FEVER.

More than twenty years ago a correspondent communicated to the *Scientific American* the following simple treatment for scarlet fever:

When the first symptoms of the disease appear anoint the flesh of the victim from head to foot with the inside of the rind or fatty portion of a smoked ham, and renew the application as often as the flesh becomes dry. The writer had saved his own children, and after our publication we received a number of letters from persons who had tried the simple remedy in their own families with satisfactory success.

We are reminded of the above by reading in a recent number of the *Lancet* the following testimony of H. Guard Knaggs, M. D., F. L. S., on the value of anointing the infantile disorders of various kinds, reporting a number of remarkable cases in support of his theory:

"During the past eleven months I have been testing, with uniformly successful results, the value of a very simple method of treating such infantile complaints as atrophy, bronchitis, convulsions, diarrhea, febrile disturbances generally, and indeed all disorders of childhood which are accompanied by an unnatural state of the skin.

"The treatment simply consists in smearing with salad oil the whole surface of the body; from the crown of the head to the tips of the fingers and toes, the process being repeated every twelve, six, or even four hours, according to the urgency of the case. Of course, the use of a long flannel gown or small blanket is obvious, and the fluid should be slightly warmed.

"The application of oil possesses the following immense advantages over the ordinary warm bath:

"1. Skin action is more completely and permanently restored.

"2. The danger of reaction is avoided, for there is no sudden change in the temperature; and, moreover, the sheet of oil protects the surface from atmospheric influences.

"3. It acts as a fuel food, not only preventing waste of tissue, but actually increasing the bulk of the little patient.

"4. It does not depress, but, on the contrary, appears to exhilarate.

"It will scarcely be credited by many that the formidable affections above mentioned will frequently yield to this treatment or, at any rate, show signs of abatement in from twenty minutes to four and twenty hours; but such is the case, though sometimes forty-eight or even seventy-two hours will elapse before any decided signs of improvement occur."

—*Scientific American.*

PROOF OF DEATH.

—If most people are afraid of anything it is of being buried alive. That cases do happen where it is very difficult even for the experienced physician to determine whether a person is really or but apparently dead, without his having recourse to means which, while they would at once settle the dispute, would place life, if it really still existed, in jeopardy, may be judged from the fact that the French Academy some ten or fifteen years ago offered a prize of forty thousand francs for the discovery of some means by which even the inexperienced may at once determine whether in a given case death had ensued or not. A physician obtained the prize. He had discovered the following well-known phenomenon: If the hand of the suspected person is held toward the candle oı other artificial light, with the fingers stretched, and one touching the other, and one looks through the spaces between the fingers toward the light, there appears a scarlet red color where the fingers touch each other, due to the still circulating fluid blood, as it shows itself through the transparent, not yet congested tisues; but when life is extinct, this phenomenon at once ceases. The most extensive and thorough trials established the truth of this observation, and the prize was awarded to its discoverer.

When electricity, or rather its application in medicine, came in vogue, it was first thought that it would be a means of deciding whether a person was dead or not. This assumption was based upon the fact of electro-muscular contraction. But experiments soon proved that for one to three hours after death has taken place, and in some cases where rigidity but slowly ensues, for a still longer period, the muscles of a dead individual respond as well to the electric stimulus as those of the living being.

Dr. Max Buch now publishes in the *Centril. f. Neuen.* 2, '84, a modification of the above, and what promises to be a reliable and scientific proof of death; for thus far no scientific test existed.

While in the living the temperature of the surface over a muscle in the act of, or immediately after contraction, decidedly increases, this increase is utterly wanting in the dead, and even during the time (half to three hours) in which after death the muscle still retains its contractility. Having placed, therefore, a surface thermometer on the skin, and having waited until the temperature has continued at one and the same height for about five minutes, the muscle just below the bulb of the thermometer is made to contract by electric irritation. If then the column of mercury does not rapidly ascend, we have the most definite and the scientific proof that life is extinct in the body; while if the temperature increases, it is just as certain that there is still life. Under normal condition, the skin for a considerable distance increases by several degrees in temperature, if in the muscle below is caused a powerful electrical contraction; and this phenomenon is also observed in paralyzed limbs; while in the dead nerves, the production of heat, as induced by motion, has forever ceased.

The method, it is true, has not yet been tested in a cataleptic case resembling death; but it is to be supposed that as long as there is the faintest trace of circulation, so long will increased activity at any part of the body produce a corresponding increase of heat. Apropos, this observation leads us to another interesting fact. It is well known that all over in nature rapid motion calls forth heat, and this is the more apparent the more friction attends the motion. Two stones or two metals rubbed together will soon induce warmth, and the Indians are said to be able to start a fire by the violent friction of two pieces of wood with each other. It is said that no law of nature knows an exception. That may be true, but a dead body surely makes in so far an exception, as no amount of motion or friction will elicit the least warmth in the decomposing tissue. But that some mysterious process of heat regulation still is active within the dead body, may be seen from the fact that no matter what the temperature of the surrounding atmosphere, the surface of the body will go on decreasing its own temperature until the state of rigidity is ended and active decomposition commences.—*Phila. Med. and Surg. Reporter.*

ENGINE BRUSH.

I found in one of the Dental Journals the directions for making this brush, but on looking for the item to copy it for this Journal, was unable to find it.

Take your Engine Porte-Polisher and insert in it all the bristles it will hold, then drive into the centre of the brush a hard wood wedge, which should be notched to break off even with the end of the porte. Cut the bristles, leaving them about a quarter of an inch in length. A few minutes previous to using the brush, place it in water to tighten the wedge. This brush is very useful in cleaning the teeth and finishing fillings. HARPER.

SOFT SOLDER AND FLUX.

SOLDER.—Pure Tin one pound, Tea Lead half a pound, Bismuth and Rosin half an ounce each; melt all together in an iron vessel and mould into small bars.

FLUX.—Cut into small pieces half a pound of Sheet Zinc, and place in an earthen jar, then pour one pound of Muriatic Acid, let it boil half an hour, then add half an ounce of Muriate of Ammonia, quarter of an ounce of Borax; when that is dissolved add half a pound of Rain Water, and strain.

This solder may be used by melting with the blow-pipe, a soldering iron or an alcohol lamp. HARPER.

VACCINE VIRUS has been successfully cultivated, outside of the animal body, by Dr. Quist, of Helsingfors. He uses a mixture of egg albumen and glycerine, to which a little carbonate of lime has been added. Last winter the Worshipful Grocers' Company, of London, offered a prize of £1, 000 for this very thing. It is to be hoped that Dr. Quist's discovery is genuine.

QUININE is the sulphate of quinia: it contains about 75 per cent of the alkaloid. The bisulphate contains 69 to 70 per cent, but is much more soluble than the sulphate. The United States army has ordered 8,000 ounces of the bisulphate this year, and no sulphate,. which has heretofore been the favorite form of giving this active principle of Peruvian bark.

DR. CLEVENGER, of Chicago, makes the suggestion that the abra sions requiring protection by cauterization or otherwise, before conducting a *post-mortem* examination, or before dissection of the cadaver, may be discovered by holding the hands over strong aqua-ammonia. The smarting will generally reveal abrasions so minute as to escape detection otherwise.—*Medical Age.*

THE HIPPOCRATIC OATH.

I swear by Appollo, the physician, by Æsculapius, by Hygeia and Panacea, and by all the gods and godesses, that, to the best of my power and judgment, I will faithfully observe this oath and obligation. The master who has instructed me in the art I will esteem as my parents, and supply, as occasion may require, with the comforts and necessaries of life. His children I will regard as my own brothers, and if they desire to learn I will instruct them in the same art without any reward or obligation. The precepts, the explanations, and whatever else belongs to the art I will communicate to my own children, to the children of my master, to such other pupils as have subscribed the physician's oath, and to no other persons. My patients shall be treated by me to the best of my power and judgment, in the most salutary manner' without any injury or violence; neither will I be prevailed upon by another to administer pernicious physic.

BIBLIOGRAPHIC.

YEO'S PHYSIOLOGY. A manual of Physiology. By Gerald F. Yeo, M. D., F. R. C. S., Professor of Physiology at King's College, London, etc. Philadelphia, P. Blakiston, Son & Co. 1884.

This volume was written at the request of the publishers for the purpose of adding Physiology to the series of student's manuals heretofore issued by this house.

That the publishers were fortunate in the choice of an author is saying but little in favor of this work. While this volume does not contain as many words as some other text books upon the same subject, the omissions are advantageously conspicuous by their absence and the student is saved from many doubtful and confusing theories and the details of such methods as are only useful to advanced students and practitioners.

There are many points in physiology that are either not comprehended or are misunderstood by the great majority of students. In this work these points are made especially clear, and in a particular manner those that are of most importance to the medical or dental practitioner.

Less attention has been bestowed upon abstract principles, these latter being mostly left to the lecturer or teacher.

The illustrations are excellent and will generally serve well to elucidate the explanation given in the text.

The publishers have done well their share in the work; the letterpress, paper and binding being the best usually entering into the make up of this class of books.

We have had long experience in teaching this branch of medical science, and unreservedly commend this work to the student of physiology. SIGMA.

PAMPHLETS.

How Anæsthetics produce Anæsthesia. By J. F. Sanborn, M. D., D.D.S., Tabor, Iowa. (Read before the Iowa State Dental Society, May, 1884.)

Announcement of the Dental Department of the State University of Iowa, at Iowa City, Iowa. Third Session, 1884–85.

We are gratified to learn that the number of matriculates during the last session of the school was more than double that of the preceding session.

Address on Practical Medicine. By John V. Shoemaker, A. M. M. D., Chairman of the Section of Practice, etc. Delivered before the American Medical Association at the thirty-fifth annual meeting held at Washington, D. C., May 7, 1884.

Seventeenth Annual Announcement of the Boston Dental College, 485 Tremont Street. 1884–85.

Thirty-ninth Annual Announcement of the Ohio College of Dental Surgery, an institution of the dentists and for the dentists, 29 College Street, Cincinnati, Ohio. Session 1884–85.

The Dental Department of the University of Tennessee. Nashville, Seventh Annual Session, 1884-85, opens Monday Oct. 6, 1884.

New York Post-Graduate Medical School and Hospital. Third Year, Session of 1884–85. 226 East Twentieth Street, New York City.

The Maury Pamphlet. Geographical Study. "No geographer who ever lived possessed in a more eminent degree the faculty of popularizing scientific truth than the late Commodore Maury."

Transactions of the Illinois State Dental Society; Twentieth Annual Meeting held at Springfield, Ill., May, 1884.

The prompt appearance of this volume is creditable to the industry of the Publication Committee of the society, of which the secretary, Dr. J. W. Wassall, is chairman.

The annual volumes of this society are always of great excellence and this one compares favorably with its predecessors. The illustrated articles are those of Dr. W. Xavier Sudduth, on Dento-Embryonal Histology, and of Dr. J. J. R. Patrick, on Irregularities in Human Teeth. Either of them or any one of several other articles contained in the volume are well worth the annual membership fee of this society. It is, therefore, not surprising that the list of corresponding members—those resident in other States—is so unusually large. The only surprise is that this list, and also that of resident members, is not twice as large as it now is.

CORRESPONDENCE.

Editor Archives of Dentistry.—Dr. Catching, in the July number of the ARCHIVES, is pleased to allude to our comments on the recent movement to organize an additional national association as wholly "without argument or reason," and then dismissed the subject by saying "I will have to answer the doctor in the same way."

Dr. Catching's candor and simplicity in this avowal is refreshing, and it is only necessary to add that the promised performance was eminently successful.

But we must protest against the ludicrous pantomimic exhibition that represents our esteemed brother, who has of late been so pathetically lamenting the lack of "dignity" in the profession, in the self-assumed role of melo-dramatic buffoon, "gesticulating in the wildest manner, bending down in grand swoops to the floor, rearing back as for a double back action movement, swaying his body from side to side, stamping the floor, clutching the chair, and rolling his eyes as if in the last throes of death."

This is shockingly unbecoming, and we wish to give all possible emphasis to the opinion that it will be utterly hopeless to expect for American Dentistry a "world-wide recognition" of its "dignity" so long as its exemplars, par excellence, continue to indulge in such grotesque and unseemly antics. Again we protest.

J. RICHARDSON.

Terre Haute, Ind.

EDITORIAL.

THE ANNUAL MEETING OF THE AMERICAN DENTAL ASSOCIATION.

The association which met at Saratoga Springs on the 5th inst., although not so numerously attended as it should have been, and was expected to be, was a very interesting and useful meeting. The ARCHIVES has secured a very full stenographic report of the meeting, including abstracts of the papers read, all of which will appear on its pages in liberal installments in successive numbers.

A very painful accident occurred during the meeting which for a time threw a heavy cloud over the minds of those in attendance. A motherless child, five years of age, son of Dr. W. R. Clifton of Waco, Texas, was run over in the street and very seriously wounded. We are pleased to learn that the child, whose life was despaired of for a time, is now recovering and will probably soon be able to endure removal to his home. The executive committee of the association was, by unanimous vote, instructed to extend professional and financial aid to the stricken father.

The officers elect for the ensuing year are: For President, Dr. J. N. Crouse, of Chicago; for 1st Vice-President, Dr. Foster, of Baltimore; 2nd Vice-President, Dr. Rich, of Saratoga; Recording Secretary, Dr. Geo. H. Cushing, of Chicago; Corresponding Secretary, Dr. A. W. Harlan, of Chicago, and Treasurer, Dr. Geo. W. Keely, of Oxford, Ohio.

PROTECTIVE ASSOCIATION.

A Protective Association was organized at Saratoga for the purpose of defending its members against the claims of so called tooth-crown and other fradulent patents. Dr. W. H. Dwinelle of No. 15 West 34th Street, New York City, is the chief officer, and under his efficient management all may be assured of a vigorous defense.

THE NATIONAL ASSOCIATION OF DENTAL FACULTIES.

Representatives of the following named colleges met at the Sturtevant House in New York Monday, August 4, 1884, at 10 A. M. Boston Dental College, Baltimore College of Dental Surgery, Chicago College of Dental Surgery, the Dental Department of the University of Iowa, the Dental Department of the University of Michigan, the Dental Department of the University of Pennsylvania, New York College of Dentistry, Philadelphia Dental College, Pennsylvania College of Dental Surgery and the Ohio College of Dental Surgery. The Kansas City Dental College and the Dental Department of the University of California were represented by letter, and Prof. Thos. Fillebrown of the Dental Department of Harvard University was present as a spectator. After selecting Prof. C. N. Pierce as temporary chairman, and Prof. H. A. Smith as temporary secretary, a committee on permanent organization was appointed. In due course they reported a draft of a constitution and bylaws, which was adopted after some alteration, and the representatives of the ten first named colleges became members of the association.

It was agreed by the association that after the close of the sessions of 1884-85 each college belonging to the association would refuse to allow a candidate to come up for final examination who had not attended two full courses of lectures and clinical instruction, the last of which shall have been spent in the college where the candidate for graduation proposed taking his degree. A preliminary examination of all students not possessing an academic or high school education will also go into effect at the same time. A graduate of a reputable medical college who shall have spent one year in a Dental Infirmary inclusive of attendance upon one full course of lectures in a dental college, will be eligible to come up for final examination. It was agreed also that an examination of junior students should take place at the end of their first course of lectures and that certificates should be issued showing their fitness to enter the senior class of any one of the chain of colleges, and it was also agreed that no college belonging to the association would permit a student to enter the senior class of their respective institutions unless such student exhibited such a certificate of qualification. After the transaction of some routine business the association elected the following officers: President, C. N. Pierce, Philadelphia; Vice-President, R. B. Winder, Baltimore; Secretary, H. A. Smith, Cincinnati; Treasurer, A. W. Harlan, Chicago; Ex. Committee, James Truman, Philadelphia, Chairman; Frank Abbott, New York, J. Taft, Cincinnati.

A resolution was passed authorizing the executive committee to admit any college in good standing to membership by subscribing to the constitution and abiding by the resolutions adopted, and paying their pro rata of the expenses. The meeting throughout was characterized by the utmost harmony and good feeling. The association adjourned to meet the first Monday of August 1885, in the city of Minneapolis.

THE

Archives of Dentistry.

A MONTHLY RECORD OF DENTAL SCIENCE AND ART.

Vol. I., No. 9.] SEPTEMBER, 1884. [NEW SERIES.

ORIGINAL ARTICLES.

"Of all the arts in which the wise excel,
Nature's chief masterpiece is writing well."

DENTAL THERAPEUTICS.

BY L. C. INGERSOLL, D. D. S., KEOKUK, IOWA.

Read before the Iowa State Dental Society, May, 1884.

The science of therapeutics pertains to the cure of disease. A rational treatment of disease depends upon knowledge both of the nature and peculiar manifestations of diseased conditions, and also upon the nature and effects of those substances used as medicines. Hence pathology and materia medica are essential factors in the diagnosis and cure of disease.

In the direct line of progress, and as a result of more intelligent and conscientious views of the nature of dental practice, it has come to be an established doctrine of dental pathology and therapeutics, and I may say, of the more advanced portion of the dental profession also, that the extraction of teeth is a war upon nature. There have been periods in the past when the dental profession have waged a war of extermination of the teeth more destructive than decay itself—a war not yet ended.

If in the economy of nature teeth are made serviceble to the nutrition of the body, it is plain that they are needed, and nature designed that they should remain so long as the economy of nature is unchanged and nutrition of the body is needed in the support of life. It is a plain inference, also, that the body suffers loss whenever a single tooth is extracted, or from any cause rendered unserviceable.

The perfect health of the body depends upon the complete performances of function of every bodily organ. When, then, a single tooth is in a diseased condition which impairs its function or gives conscious pain, bodily health suffers because of the vital relations existing between all organs and parts of the body. How, then, can a dentist, who has any regard for the perpetuation of his race and the highest development and well-being of human nature, look with indifference upon a diseased tooth?—especially when it is a fact of such common observation that pain in a single tooth may and often does cause great waste of the vital energies. To prevent and to cure disease is the mission of the doctor and the dentist, and by so doing to prevent the waste of human life.

There is scarcely a person who enters a dental office for a mechanical or surgical operation in the mouth who does not also need therapeutical treatment of that local character in which dentists are chiefly concerned.

A glance at some of the chief characteristics of bodily disease will aid us in arriving at an intelligent judgment concerning remedies for any particular diseased condition.

Functional action, on which life depends, means motion. Hence mobility of parts constitutes one of the chief characteristics of our normal animal organism. The greatest mobility is in the fluids of the body, and chief among these is the blood, which constitutes in the adult from sixteen to twenty pounds of the total weight of the body; while the whole of the fluid portion of the body is almost seven-tenths of its weight. Movement of the fluids of the body is one of the essential features of a healthy condition. A movement either too active or too sluggish is an indication of disease. This fact is so fully recognized that it has come to be one of the chief diagnostic signs in a medical examination. The physician in coming to the bedside of his patient first feels the pulse to learn the variation of the movement of the blood current from its normal flow. Though the blood is the most active, all the other fluids and semi-fluids undergo some active change. Stagnation means death. The current *must move on* if health is to be maintained. Dam up the channel through which any of the fluids of the body normally flow and disease and possibly death will be the result.

Associated with the mobility of the fluids of the body is the mobility of the muscular and fibrous tissues, which by their contractions and elongations are, secondarily at least, the cause of the movement of the various fluids of the body. This tissue-exercise is necessary to prevent atrophy and promote health of the parts themselves. I go back now to my former proposition, that motion, or mobility of parts, is one of the essential characteristics of normal physical life. It is only *running* water that is pure and healthful. Stagnant water has the poison of death in it. Pent up, motionless air, is dead air, and has not the invigorating influence of a tonic in it, but causes faintness and death.

I have said thus much by way of presenting a basis of principle on which to build a therapeutical practice. In every case of disease there is a cessation of activity or motion somewhere, in some part of the body, necessitating usually increased activity in other organs or parts of the body to overcome the stoppage. For example, the increased rapidity in the blood current in the arteries observed in the inflammatory condition, is an effort of nature to overcome the tendency to stagnation, engorgement and stoppage of the blood in the veins and capillaries which is known in pathological science as inflammatory stasis.

A rational treatment, therefore, in such a case would be to assist nature to overcome the tendency to blood stasis—to equalize the circulation by quickening capillary action, which in itself would reduce the increased action in the arteries.

The process by which this is accomplished is called stimulation, and the medicines employed are called stimulants. The word stimulant is derived from the latin word *stimulare*, to goad—having reference to an ancient method of urging on work animals to the performance of their task. The goad consisted of a stick a few feet in length armed with a sharp brad at one end with which to prick the animal and thus *goad* him on to more speed and the exercise of greater strength in pulling his load. Hence the purpose of stimulants is to excite and urge on the organs and tissues to the more prompt and active performance of function.

Wishing to confine myself to the dental practice, I will take for example a case of inflammation of the gum or of the peridental membrane.

That irritation, whatever it may be, which is the first stage in the inflammatory processes, induces a rapid flow of blood to the irritated part. The rapidity of the flow causes friction and heat in the vascular tissue. Some think that the heat is promoted also by chemical decomposition. This heat expands the arteries and invites a still larger quantity of blood—so large that the capillaries are no longer able to carry the increased quantity of blood over into the veins.

This engorgement in veins and capillaries is indicated by a change of color from the bright red of the arterial blood to the purplish hue of the veinous blood. This engorgement also causes a slowing of the blood current. It acts precisely like the partial damming up of a stream of water; the current is partially arrested. This retarding of the blood current indicates the second stage in the inflammatory processes, characterised by a sense of fullness and pressure, because the blood coming to the affected part is not able to pass on with the same rapidity as before. This causes pain and slight swelling. This is the pathological condition of an inflamed gum, root membrane, or pulp. This is the condition which we wish by stimulants to reduce to the normal condition. It is evident that if this partial engorgement continues the inflammation will either become chronic or, by complete engorgement and blood stasis, the affected part will be found in the very painful condition of congestion. How shall we prevent these worse consequences?

Common sense says, arrest the abnormal flow of blood to the part, and break the engorgement of the capiliaries and veins. Let us apply common sense to a case of inflammation of the root membranes. One without any knowledge of pathological conditions or of the stimulating effects of heat, when he has a tooth tender to the touch, slightly loose, and elongated, with a sense of fullness, pressure and pain, applies his face very near to a hot stove and finds the pain relieved. How has this been accomplished? Heat expands the capillaries and veins and their enlarged capacity permits a greater amount of blood to flow, and thus the tendency to blood stasis is arrested. The same may be accomplished mechanically. When one has a tooth in the condition before described, if he will bring his teeth together firmly and hold the jaws thus occluded, the pain will, for the time being, cease, because the mechanical pressure upon the tooth forces the blood out of the arteries and allows no more blood to enter the inflamed membrane than can be passed on through the capillaries and veins. This equalizes the circulation, and the pain ceases.

When inflammation is suddenly excited by the violence of a blow—for example, an arm or a hand becomes bruised—blood rushing rapidly to the injured part is arrested in its flow by the contusion. The most natural thing for one to do under such circumstances is, to rub the part affected. The rubbing prevents the stoppage of the blood at the point of contusion. If the rubbing is continued long enough, and the fluids kept in motion, uniform circulation is re-established, and there will be no inflammation or soreness.

There are organs and parts subject to inflammation which will not admit of any of the treatment referred to; or, if at all, not long enough to overcome the tendency to stasis and congestion. Hence medical therapeutics—or the resort to drugs.

The action of stimulants, locally applied, depends upon the irritability of the tissues involved. Any drug that will produce a sensible stinging, smarting or burning will excite vascular action. If the capillaries can thus be expanded and their functional action quickened their tendency to engorgement will be over and the normal condition of the blood-flow be restored.

A large number of stimuli might here be named, each of which has merit. But it is important in selecting a local stimulant, to select one that not only has stimulating properties but is comparatively free from objectionable properties. Too active a stimulant may have but a temporary effect as a stimulant, while its prolonged effect may be that of a sedative. Of such is chloroform. Some powerful stimuli have a superficial caustic effect. Having thus devitalized the external layer of the tissues, the action of the stimulant upon the tissues underneath is prevented. Of this class is carbolic acid in its undiluted form.

Some stimuli are possessed of the property of forming coagula whenever brought in contact with any of the albuminoid or serous fluids. Such coagula will greatly lessen the penetrating power of the stimulant, so that if it be desirable to stimulate the arterial system which is not so superficial as the venous and capillary systems, the treatment may fail. Of this class are creasote and alcohol and astringents. The whole class of alcoholic stimuli are, therefore, objectionable. Should the inflammation of the gum have been so prolonged that the third stage, that of congestion, is reached, when the capilliary vessels are so much weakened that at every touch of the gum blood oozes out, then such drugs as form coagula are indicated, as a primary treatment.

In such case my treatment would be creasote and tannin, followed in proper time by an active stimulant.

Of all stimulants applied locally to affect the vascular tissue there is probably nothing superior to capsicum.

This is found in the shops both in the berry of the plant and powdered. It is of a yellowish red color commonly known as red pepper, cayenne pepper or Guinea pepper. In its preparation for medicinal purposes there is first obtained a gummy extract which is soluble to a considerable degree in water, but more soluble in vinegar, alcohol and ether.

It is commonly found in form of an alcoholic tincture or a fluid extract. The fluid extract is preferable for the reason that it contains less alcohol. If the tincture is used, it should be diluted with water fifty per cent. Capsicum has a sharp, biting, bitterish taste, with a sense of burning over the whole matter. The name is derived from the Greek word *kapto*, I bite. It belongs to the class of *persistent* stimulants because of its prolonged effect in quickening the circulation, thereby overcoming the tendency to blood stasis and congestion. In cases of incipient abscess, if early applied, it tends to promote *resolution*. It is especially indicated in chronic inflammations and indurated condition of the gums. I refer to those cases where, instead of the soft swelling which is usually found in a developing abscess, there is found a hard lump with no pain.

A modern, ingenious and very successful method of applying capsicum to an inflamed gum is by the use of the powdered capsicum in a small almond shaped bag. The capsicum bag was, I believe, the invention of a lady belonging to that refined class in society who cultivate the grace of facial expression by chewing gum. She was advised to stimulate her face with mustard to relieve an aching tooth. Instead of applying on the outside, as is usual, she moulded her chewing gum into the form of the bowl of a tea spoon, and, putting ground mustard into the concavity, she returned the gum to her mouth with the mustard resting on the inflamed part.

RECAPITULATION.

The life and health of the bodily organism is manifested by motion. The various organs, tissues and fluids of the body act or are acted upon in the exercise of the various functions of life. As motion is one of the chief characteristics of life and health, so inaction—the cessation of the motion—is one of the chief characteristics of disease and death.

In a condition of disease there is a perpetual tendency to functional inaction and stagnation of the fluids in some part of the body. Restoration to health involves the stimulating of functional activity by the use of medicinal stimuli or mechanical operations overcoming the tendency to the stagnation of the fluids, chief among which is the blood.

In every case of inflammation, the manifestation of too great vascular activity in one part is indication of too little vascular activity in another part. Equalizing the circulation is a health-giving process. In case of local inflammations the mechanical action of rubbing alone may overcome the tendency to blood stasis. If not, resort may be had to vascular stimulation by the use of such drugs as cause a sense of smarting, burning, stinging. Capsicum being one of the most persistent of this class is highly recommended.

DENTAL DIAGNOSIS.

BY A. T. BIGELOW, D. D. S., BISMARCK, DAKOTA.

To every one who considers the matter, it must be evident that this is an important branch of dental pathology.

The scope of this paper will be limited to the consideration of a few points, deemed essential, mostly the deductions of actual observation and experience.

Ætiology will not be touched on, but rather the ascertainment of actual conditions on inspection, as a basis for intelligent professional service.

The face of every tooth should be presented, directly or by reflected image, to the eye, especially the approximal surfaces whenever there is reason, from general indication, to suspect decay.

Stress is laid on this, on account of the approximal surfaces being less accessible, and as being the part most commonly neglected.

Direct separation by wedging,if the teeth are not firm in sockets, will afford requisite space, or a section of French tubing number ten, employed where the first method is not practicable.

Given an educated eye, a good plain five eighths inch mirror, slightly heated, several delicate exploring instruments of suitable construction, and "ocular proof" may be had of the encroachment of the greatest enemy, caries. On a suitable diagram should be noted the defects revealed, beginning with the right dens sapientiæ as number one, and ending with its antagonist as number thirty-two.

This will afford a comprehensive idea of the general condition of the organs and their needs.

If a complete examination is not desired, but only attention to immediately necessitous cases, these may be easily detected on mesial and distal surfaces of bicuspids and molars by drying with a hot air syringe, and observing the discoloration, or opaqueness, ranging from pale yellow to blueish black.

In all cases where decay has progressed extensively and the patient has felt marked discomfort, or pain, very nice discrimination will need to be exercised to effect a sound diagnosis. Would first ascertain for how long time and to what extent disagreeable sensations have been experienced. If of recent origin and no more than an occasional "twinge," capping at once would be indicated.

If the trouble has existed for some weeks the pain at times lancinating, with intervals of quiet, there is considerable inflammation, and soothing applications should be made, and the air excluded for a time, before permanent stopping is effected. In more serious cases where the sharp and intermittent have merged into constant grinding pains, there is much inflammation with congestion, probably involving the whole of the ganglion and possibly extending into one or more of the canals. Very likely on removal of the detritus there will appear a protrusion of the pulp into the cavity of decay. If without suppuration would resort to a little blood-letting by acupuncture to relieve distended vessels, applying topical dressing. Should the case yield kindly and the inflammation subside without suppuration, the operation of capping and filling may eventually be performed with a good prospect of success. Have never tried Dr. Allport's method of incising the protuberant pulp to accomplish the same object, the needle lance operation being less heroic but equally effectual in results, the enlargement usually contracting to normal size on depletion of blood vessels, in a few days.

If the more advanced stage has been reached, and partial sepsis occurred, would deem capping contra-indicated. I have dwelt at some length on the indications favorable and otherwise for saving the life of the tooth, having been frequently called upon by patients in transit to relieve them from severe suffering. On minute examination have found too often, for the honor of the profession, fillings inserted on devitalized pulps, or that the operation of capping had been so inconsiderately, or unskillfully performed that the death of the pulp ensued.

Recently service was rendered a patient who said her teeth were pronounced in good condition by her family dentist only a short time before she left for the west. The name given is not unknown to the profession, and the gold work exhibited was exceptionally fine. Only a glance was needed to disclose the tell tale opaqueness on mesial surface of first left superior molar, and excavation developed a large cavity that must have had its inception more than a twelve month previously. Was it culpable negligence or want of apprehension of pathological indications? This is cited as a typical case to show the necessity of systematic practice that our clientage may not suffer,from the detective faculty being faulty, where the manipulative ability is excellent. There are other and less common dental affections that require much skill and experience in determining their nature, in some instances baffling all known means of ascertainment. Will offer a few selected from my case book, in illustration. Patient complained of a slight unpleasantness in one of the superior incisors. No external defect appeared. The color of left central was a shade darker than that of the adjoining teeth, but with no more variation than is often seen between incisors and cuspidati. No marked sensation produced on tapping with an instrument. In such a case the phonetic or percussive method may be adopted to detect a necrosed tooth, similar to that employed in diagnosing diseases of the thorax or abdomen.

The most available agent to employ is the ivory handle of a mouth mirror. It should be held between the thumb and second finger of right hand and gently tapped with index finger, applying the blow to the labial surface. The sound elicited from a normal tooth will be found clear and resonant,while the necrosed organ yields a sound perceptibly lower in pitch and more muffled or obscure. These distinctions have proved constant so far as I have yet experimented and may be relied upon in determining those infrequent cases where from a blow or some unknown cause, the pulp has lost its vitality. The proper employment of this mode necessitates some degree of skill in application, and the possession of a musical ear, capable of detecting minute variations in quality of sound.

A young married lady consulted me on account of severe pain located in first left superior molar, for which, after the most careful scrutiny, I was unable to assign any adequate cause. There was a small gold filling on grinding, and a somewhat larger one on anterior approximal surface, but did not suspect that the latter encroached upon the pulp. There seemed to be no symptoms of exostosis and the general health of patient precluded any probability of the cause being reflex or sympathetic. In my perplexity I had recourse to the Micawber plan, hoping something might "turn up" to help me out of the dilemma. The only clew afforded was that in treating the corresponding molar, about six months previously, a small calcification had been discovered in the pulp after its removal, and this seemed a good opportunity to test the bilateral theory. Not wishing, however, to make a serious error in treatment, I removed the larger filling, applied a pellet of cotton saturated with pure wood creasote, painted the gums with aconite and iodine, and requested the patient to call next day. She reported early in the morning, having suffered considerably during the night, and desired the tooth extracted. This I declined to do, but made the usual application to destroy pulp, and on the second day thereafter had the satisfaction of finding in distal portion of ganglionic cavity a large calcification, having somewhat the form of an ellipse, measuring in length twelve one hundreths, and in the short diameter, six and one half one hundredths of an inch. Viewed superficially with a low power microscope, it presents more the appearance of cementum than of enamel or dentine, It is presumably of the same constitution as the so called secondary dentine.

I will now give the history of a unique case. A healthy looking young lady, about twenty years of age, visited my office on account of severe pain, located in first and second right superior molars. Careful examination showed no cause, in fact her denture was exceptionally perfect in form and structure, no caries being present. I had much difficulty in persuading her to delay the extraction for a day or two; meantime topical application was made, more to gain time than with any expectation of amelioration. On the second day there was observed, over the seat of pain, a slight swelling, accompanied by redness and inflammation. Being satisfied it was a disease, not having a strictly dental origin, the patient was recommended to consult a physician. The doctor advised with, pronounced it erysipelas. The case was successfully treated and she had no further trouble with her teeth.

A young man of twenty-five years of age had been considerably annoyed for several days by pain that he thought proceeded from the first right superior bicuspid, which had been treated about a year previously and roots filled. The gums were healthy, tooth firm in socket, no pain caused on percussion, the other teeth were in a sound state, so I concluded the cause was sympathetic. A slightly flushed appearance was observed on his face and neck, with numerous small red spots, and feeling relieved of my perplexity, informed him that I thought he had an attack of measles, and directed him to a physician with the assurance that he need have no more solicitude regarding the reflex pain. The medical gentleman, a veteran in the healing art, gravely thanked him for coming "labeled" as he phrased it. The case proved a comparatively mild one and there was no recurrence of the local symptoms.

The case about to be reported is one easy for a dentist to diagnose, but it would seem rather perplexing to the general practitioner of medicine. A young man desired relief from an annoying pustule on the chin. After examination, advised the extraction of root of inferior right cuspid. He objected and sought an easier solution. He next consulted his family doctor, who diagnosed scrofula. This view angered the patient's mother, who indignantly asserted that Dr. —— well knew there was nothing of the kind in her family. He next advised with Dr H——, who took a less serious view, but was disposed to prescribe cachetic remedies. Finally an eminent city physician, Dr. P——, was consulted, and when informed of his dentist's opinion of the cause, he laughingly averred that they (the dentists) ascribed all affections of the face to the teeth, but he would give him a simple salve that would cure that little pimple in a few days. It did film it over for a short time until the pus from alveolar abscess accumulated sufficiently to open it afresh. The patient then came and had the root removed; the only after treatment was syringing with dilute carbolic acid. The fistulous opening readily closed, leaving only a slight discoloration of the skin. I will briefly narrate a severe case, the facts of which were received from the sufferer in person. A gentleman, past middle life, submitted to the extraction of his upper teeth by a country physician in the absence of a local dentist, preparatory to the insertion of an artificial denture. Being wholly unskilled in the art, the operation was a crucial test of the patient's fortitude, and the root of one of the right bicuspids after vigorous, but misdirected efforts at removal, was abandoned. The patient experienced much pain, beginning soon after the attempt at extraction, having its origin in right cheek and several dentists and physicians were consulted, but without obtaining relief, as no one seemed to understand the case. The swelling became quite prominent upon that side of the face and somewhat indurated. One surgeon gave it as his opinion that it was scirrhus, but declined to operate. The outcome was that after having suffered excruciatingly for nearly six months, with much impairment of general health, an abscess broke at the seat of difficulty and from thence came the unextracted portion of bicuspid, evidently pushed into the antrum (maxilliary sinus) by the doctor, months previously. Comment is unnecessary. It will suffice to state that the trouble soon disappeared and the patient regained his health, but a deep funnel-shaped cavity will mar his face for life.

These various cases have been instanced as tending to show that a dentist should be possessed of some general knowledge of the human system in health and disease, that invaluable organs may not be needlessly sacrificed or unnecessary suffering entailed, from not apprehending the various pathological signs presented to his notice. Would always advise the expectant method, where there is a likelihood of speedily obtaining a better knowledge of the inciting cause, that the conclusion arrived at may harmonize with the facts, bearing in mind that symptoms guide to, and are indicative of, but never constitute the disease itself.

MR. SAMPSON GAMGEE gives the following advice to surgical operators and dressers: "Cultivate light touching as an art; probe without thrusting, cut without bruising, separate without tearing, manipulate without mauling. A portion of the advice is quite as applicable to the dentist as to the surgeon or his assistant.

SELECTIONS.

THE GERM THEORY OF DENTAL CARIES.

BY F. SEARLE, D. D. S., SPRINGFIELD, MASS.

In 1877 Arthur S. Underwood, M. R. C. S., L. D. S., Eng., and W. J. Milles, L. R. C. P., London, F. R. C. and C., undertook "to determine, as far as possible, to what extent germs are present in the dental tissue when in a state of disease; and to deduce conclusions as to the effect of their presence." After four years' patient investigation, they publish their first report of their progress in a paper read before the International Medical Congress, in which they say:

"We consider that caries is absolutely dependent upon the presence and prolification of organisms. This view we propose to call the 'septic theory.'"

In the examination of this theory, it will be necessary to go over a somewhat extended field of inquiry, and introduce some other theories for examination. Investigators into the phenomena of diseases are liable to seek an explanation in the insufficient evidences of their own discoveries, without taking into account what others have done or are doing in the study of questions bearing directly upon the subject which they are examining. Especially has this been the case with recent investigators of dental caries.

When Underwood and Milles in England were making their investigations in relation to organisms, they seemingly did not take into account the discoveries of Dr. Bodecker, of New York, in relation to the distribution of living matter in bone, dentine, enamel and cementum, or of the observations of Dr. Abbott respecting the evidence of inflammation in diseased fibrils. Dr. Abbott was equally uninformed of what Underwood and Milles were proving in regard to the presence and agency of germs in the fibrils. He sawthe evidences of inflammation, but not, as I think,the *true irritant.* Underwood and Milles saw the irritant, but not the *inflammatory appearances* of the fibrils, or at least did not take them into account; consequently, they announced their septic theory, and Dr. Abbott his inflammation theory. The reviewer can gather and arrange all the evidence from all sources and thus form an unbroken chain of evidence, composed of demonstrated facts and legitimate deductions from those facts, which will explain more than any theory supported only by incomplete and one-sided observations.

I propose to gather up the important facts which have been reasonably well established, bearing upon the question of caries, separating them from mere opinions; and endeavor to find what they teach.

Our subject is intimately related to questions which have occupied the attention of chemists for more than two hundred years. It is, in fact, one of the latest questions of a large and rapidly increasing number, growing out of those minute yeast granules which Leeuwenhock discovered in 1680, and which Cagniard-Latour, and Schwann, *re*-discovered in 1836–39, and which were the starting point of that long discussion between Pasteur and Liebig and their respective schools of the true theory of fermentation, which lasted from 1840 to 1870, and which the illustrious Pasteur has completely answered by a series of experiments which, in the language of Milles, are "classed among the most brilliant records in the history of science." "The true ferments are now known to be living organisms that produce fermentation as a function of vital activity. Unlike the soluble ferments, these living organisms increase at the expense of the substance fermented. The true fermentations are purely physiological processes, which are defined by Pasteur as the "direct consequence of the processes of nutrition, assimilation and life when they are carried on without the aid of free oxygen, or as a result of life without the aid of free oxygen, or as a result of life without air." (P. S. M., p. 225.)

The discoveries of Schwann, Pasteur and others, in regard to the agency of the germs of micro-organisms, laid the foundation upon which Lister, 1865–67, established the germ theory of contagious diseases, and the septic character of some diseases not so contagious. Lister, an eminent French surgeon, had previously exhausted all the resources of the old methods of dealing with septic diseases by efforts to exclude the oxygen of the air from wounds, etc., with unsatisfactory results. The revelations of Pasteur opened his eyes to the fact that his foundation principles were defective, and consequently his methods could not be successful. In 1867 he published the results of his antiseptic (and aseptic) methods which he had been testing for two years, with previously unheard-of success. This brought the great revolution in general surgery which immediately followed, the principles of which have been generally accepted, and now direct the methods of surgery. Without the discoveries of Pasteur and Lister the germ theory of dental diseases would have been long deferred.

In 1873, Liebig and Rottenstein published their work on Dental Caries and its Cause, which contains much of interest upon the existing theories, especially in relation to the germ theory, which they were the first to put into definite form. But the chemical theory held its ground in spite of their discoveries, because there was no Lister to give clinical demonstration of the correctness of their views. We hear but little more upon the subject except in general allusions to the theory in partial approval, until 1881, when Underwood and Milles published their first paper.

The failure of the chemical theory by acids to explain satisfactorily all the conditions present in caries, led these gentlemen "to seek for the presence of organisms in carious dentine with results that far exceeded their expectations."

Their first paper contains the following conclusions:

1. "We consider that caries is absolutely dependent upon the presence and prolification of organisms; that these organisms attack first the organic material and, feeding upon it, create an acid which removes the lime salts. * * * *

2. "That suppuration of the pulp and its sequences, such as alveolar abscess, depend also upon the successful working of organisms."

In their second paper they say: "We are anxious that you should keep clearly before you four main issues upon which all the theory which we suggested to you in 1881 depends:

1. "That certain forms of micro-organisms, viz: Micrococci, oval bacteria and short bacilli, are invariably present in carious dentine.

2. "That these micro-organisms extend into the tissue as far as does the caries.

3. "That no agent can be made to produce a change resembling caries in the absence of such micro-organisms."

(The fourth I omit.)

They add: "We feel convinced that the process, to be effective, must be carried on in a living mouth, probably because that is the only situation in which the special germs are really active. Analogy seems to warrant this deduction; but, all we claim for the germs is, that without them and their products the process could not go on at all, and the dental pathology of the future must include them among the most powerful factors in the production of this disease."

To Underwood and Milles the world is indebted not only for the facts which they were the first to demonstrate, but also for the impulse which their labors gave to other men to make additions to their discoveries.

In the *New England Journal of Dentistry*, Jan., 1883, Prof. Mayr gives the results of a series of very careful experiments made in the line of analyzing decayed dentine. Of these experiments Underwood and Milles say: "Prof. Mayr has worked out the chemical aspect of the question with great care and exactness." That he is fully competent for a work of this kind, involving great care and labor, no candid man, who is at all acquainted with him personally, with his educational training in the best schools in Germany, his acquaintance with medical and other sciences, and especially his ability in his chosen profession as a chemist, will for a moment question. I give the results of his experiments on the point bearing on the question of dental caries. First, he says: "Let us never confound two things: the structure of a tooth and the chemical nature of a tooth, and that the structure may be broken down and the chemical nature not changed. Result No. 1: No acids or chemical lime salts are found in the innermost decayed mass. While the chemical composition of the innermost layer is almost (and as was seen in some cases completely) identical with that of healthy teeth, the structure is totally different. The soft, white, friable decay is no longer organized, though chemically only slightly differing from the tooth subtance—one showing 72 per cent. lime-salts. The action at the innermost layer is not in accordance with what we know about the action of acids."

This paper of Prof. Mayr is full of suggestions and facts bearing directly upon the chemical aspect of the question of caries, and furnishing much evidence in favor of the septic theory.

Dr. W. D. Miller, of Berlin, within the last two years, has published many papers giving at length the processes of his experiments and observations relating to caries, which deserve notice. He then gives the description of the investigations which led him to several conclusions, of which I quote the following:

"The bacilli penetrate far into the dentine, even into the finest branches of the canaliculi. Micrococci penetrate furtherest." (i. e., further than the minutest branches (?)). "The fungi produce anatomical and pathological changes in the deeper layers, stop up the canaliculi and necessarily lead sooner or later to the death of the dentinal fibrils. The outer layers of dentine, thereby deprived of nourishment, die and fall a prey to putrefactive agents."

Dr. Miller thus fully confirms the observations of Underwood and Milles, of Lister and Rottenstein, and every other careful observer, and the presence of organisms in the deeper portion of carious dentine may be considered as fully established.

Dr. Miller differs from Underwood and Milles in this: He claims that there is a zone of softened dentine between that occupied by the organisms and the healthy dentine, which is not infected. His opinion is based on microscopical observations,and this after having said that the bacilli penetrate even into the finest branches of the dentine (softened dentine), and the micrococci penetrate further still.

Underwood and Milles, on the other hand, prove that the germs are present up to the uttermost limit of the affected dentine, by inoculating a pure culture with matter taken from the deeper portions thereof—from the very border line of decay. In other words, they find them attacking the living *organic tissue* of dentine. The question of the effect of their presence here is now the one of paramount importance. The settlement of this very interesting question does not depend upon what organisms or acids may be doing at the more superficial points of the carious mass, nor whether the acids are organic or chemical, but what is going on at the line of battle, where the amæba-like cells of the organisms and bioplasson are contending for dear life, and for food to sustain that life.

Neither Underwood and Milles, nor Dr. Miller, are able to solve this question on the theory that organisms do their work by the acids which they produce. The former say: "The essential element wanting in our artificial experiments is present in the mouth." Dr. Miller says: "I am a believer in acids, a believer in micro-organisms, and a believer in an *unknown cause*; that is, I believe that there are agents active in the production of caries which are yet to be discovered."

Two questions here arise:

1. Is the tooth endowed with living matter capable of taking on inflammatory action?

2. Is there evidence to conclude that the results of inflammory

processes in dentine are analogous to those in bone and other tissues?

In answering the first question, I will refer you to the discoveries of Prof. Heitzmann in relation to the reticular structure of protoplasm, which connect every tissue and organ as it were into one large amæba, and to the researches of Dr. Bodecker concerning "The Distribution of Living Matter in Human Dentine, Cement and Enamel," together with the evidences which your experience furnishes in your operations upon the teeth. If these, united, do not bring evidence to your minds sufficient to make you give an affirmative answer, ask your patients. Do not think, because these tissues belong to the microscopic world, that they cannot be injured and take on inflammation. All normal and abnormal life action, whether growth or decay, the building up or the taking down of molecule and tissues, belong to the microspic world. If you discard the vital changes in one set of tissues, why not in all? Yes, there is the intensest vitality in the reticular matter of a tooth. To talk of its low vitality is to contradict the plainest evidence that can be brought to the human intellect.

In answer to the second question, if you admit the self-evident fact of its ability to live and grow and be healthy, you must also admit its liability to disease.

This brings me to the consideration of the inflammation theory of Dr. Abbott.

It has been shown in the laboratory of Prof. Heitzmann that dentine has been dissolved and formation of abnormal tissue has taken its place. This has taken place by true physiological, though abnormal, vital processes. When Dr. Abbott was making his investigations in connection with Dr. Bodecker in regard to living matter in the teeth, he observed in the diseased fibrils of the tooth appearances characteristic of the presence of inflammation in other hard tissues, which he thus describes:

"First, irritation(which he thinks is produced by acids), followed by inflammation, swelling of the living matter, which effects the dislodgment of the lime-salts; a melting down of the glue-giving basis-substance, and a bringing to view the embryonal elements of the enamel. These processes follow in greater intensity in the dentine. The lime-salts are not necessarily dissolved and taken away, but may, and I have no doubt, as Prof. Mayr's experiments show, do remain mixed with this disorganized tooth substance."

On the hypothesis that acids produce the irritation of the living matter—the reticulum—at the border-line of decay, why should they not also decalcify the lime-salts at this line? Prof. Mayr finds no trace of acids there, and Dr. Abbott accepts the conclusion that they are not there. How, then, can acids set up inflammation? When the germ theory is accepted, the presence of acids at this point will be unnecessary to account for the agents of irritation. With vital organisms feeding upon and multiplying within the pabulum contained in the canaliculi, exhausting and injuring the reticulum, which is directly connected with the reticulum of the pulp and the whole system of tissues, the usual effects of irritation follow until the melting down of the formed material, the liberation of the lime-salts from its meshes and the death of the reticulum put an end to the vital reaction, and the mass is given up to the action of organisms and their products.

The facts already presented are sufficient to establish the septic character of the disease affecting the albuminous or "animal" portions of dentine where caries is present.

It is not quite evident why Underwood and Milles gave the name "septic theory," to their explanation of caries—a disease dependent upon the presence of organisms—rather than the more appropriate term "germ theory," originally given by Pasteur, to explain the same class of diseases. Having proved that the organisms were derived from germs, Pasteur gave the name "germ theory" to distinguish it from other theories of septic diseases then in vogue. If the septic theory, as applied to dental caries, has any significance, it is identical with that of "germ theory," which certainly is more appropriate. Besides, there are already in medical use a sufficient number of different terms, meaning one and the same thing. It is desirable, therefore, for the sake of the illustrious man who gave the name, as well as for appropriateness and uniformity, to retain the use of the term, "germ theory."

In looking for data upon which to show the effects produced by bacteria in or upon the tissues in which they are found, we cannot do otherwise than to refer to papers and text-books which are regarded as authority in this department of knowledge. I shall not introduce the question of the different genera and species of bacteria, as this would open too large a field, and would not be pertinent to my purpose. We have to deal now only with the micro-organisms, called pathogenous bacteria.

Zeigler, in his text-book on Pathological Anatomy, says: "It has long been known that certain diseases arise in consequence of the settlement of certain plants and animals in the human organism. Only of late years have we learned that the domain of these parasitic disorders are of wide and far-reaching extent. Some of these parasites or bacteria find their appropriate soil in the perfectly healthy tissues, in which they grow and multiply; others can only develop in tissues morbidly changed so as to correspond to their requirements. All that is necessary is that a bacterium should reach a spot that affords the conditions for its development. In this it multiplies and forms colonies, which live at the expense of the tissue invaded. Sooner or later these local settlements bring about degeneration and necrosis of the affected tissue, depending upon the nature of the bacteria and of the tissue.

"In the first place, the bacteria, as they grow and multiply, withdraw from the nutrient fluid of the tissues the elements they require for building up their own cells. The elements are chiefly nitrogen, carbon, hydrogen and oxygen, and also the inorganic components of sulphur, phosphorus, magnesium and potassium. In the next place, they set up marked chemical changes in the nutrient fluid. It is bacteria which superinduce putrid decomposition in albuminoid bodies; they transform sugar into lactic acid; lactic acid into butyric acid; and alcohol into acetic acid. When albuminoids undergo putrid decomposition we have formed peptones and similar bodies: a certain principle or poison; and bodies resembling ferments.

"Pasteur, Lister and others speak of the decomposition as the direct result of the growth of bacteria. Decomposition and fungus are inseparable; the one ceases when the other is removed. Processes of this nature, set up by bacteria, are best distinguished as fermentation. Considered with respect to their property of setting up fermentation, bacteria are often described as organized ferments. Bacteria have also the power of setting free certain substances which have a decomposing action like themselves, and are known as unorganized ferments.

"Pasteur regards fermentation as immediately dependent on the activity of the organisms. Fermentation begins only when the supply of free oxygen to the bacteria is restricted. They then begin to abstract oxygen from the compound contained in the tissues or nutrient fluid, and so disturb their equilibrium.

"Fermentation and putrefaction can only take place in presence of the corresponding fungi, and the amount of decomposition produced depends on the quantity of the fungi present. It does not, however, follow that each kind of decomposition is due to a single specific fungus, nor that one fungus may not give rise to more than one kind of decomposition. In most putrefying substances we find bacteria of several species.

"In general terms, we may say that local settlements of bacteria will sooner or later bring about degeneration and necrosis of the affected tissues. When this may occur, and how widely it may spread, are circumstances depending on the nature of the bacteria and of the tissue.

"Each kind of bacteria has a corresponding special group of tissues in which its mischievous effects are invariable and especially apparent. If they reach the blood, through the lymphatics, or directly, they are carried by it to remote parts. Many of them perish in the blood, others again increase and multiply. Once in the body, they multiply in the blood or in some tissue, spread through the system, and call forth the special changes characterizing the several diseases." He might have added: Once in the teeth, the bacteria advance from enamel to dentine, from dentine to pulp, from pulp to perios, and to the soft tissues of the bone, sometimes causing extensive necrosis and, in rare instances, pyæmia.

In this connection, i. e., to show the agency of bacteria in producing disease, I will add only the following from Tyndall. Speaking of the relation of living organisms, he says: "Living ferments, finding lodgment in the body, increase there and multiply directly, ruining the tissue on which they subsist." Again, he says: "For in that common ferment there seems now to be identified a force which, acting on organic matter, whether dead or living, can on the one hand initiate putrefaction in what is dead, and on the other hand initiate inflammatory processes in what is living."

Enough has been quoted from the writings of the world's best scientists to show the action of pathogenic bacteria on soft tissues. The question next to be determined is, do soft tissues exist in the teeth?

The knowledge of the minute anatomy and physiology of the teeth has been a matter of slow development, dependent upon the improvements of the microscope and the methods of preparing specimens; also of the training of the eye to make correct observations. Up to the time of the opening of Prof. Heitzmann's school in New York, and the more thorough study of the histology of the teeth by Dr. Bodecker and many others, the teachings prevailed that "the dentine is a homogeneous calcareous matrix in which no trace of cellular or other structure can be detected, permeated by minute tubes radiating from the pulp cavity, which are occupied by fibrils proceeding from the pulp and endowing the tissue with sensibility. The tubes being so minute that their actual structure cannot be determined, but they undoubtedly are the sole protoplasmic constituents of dentine. The organic basis is contained in the inner walls of the tubes surrounding the fibrils. No cellular or protoplasmic elements are discoverable in this fibrous structure; the vessels of the pulp are not in intimate contact with dentine; the dentine and enamel are incapable of anything like pathological action," etc.

Dr. Miller says, in a paper just published in the *Dental Record* that in the teeth the lime-salts form a definite chemical combination much more insoluble than the lime-salts themselves; that this combination is the result of the vital force in the tooth itself. Dr. Miller gives no authority for this statement. These teachings are directly at variance with the observations made by Prof. Heitzmann, Dr. Bodecker, Dr. Abbott, and many others in the New York School of Microscopy. The teachings of that school are embodied in a work by Prof. Heitzmann, "Microscopic Morphology," published in 1883. Neither Underwood and Milles nor Dr. Miller seem to have been acquainted with the discoveries made in the New York school. Their papers recognize only the former views of dental anatomy, consequently they entirely ignore the possibility of any vital reaction or inflammation on the part of the bioplasson, excepting that Dr. Miller does admit that the same vital force which produced the chemical combination of the lime-salts with the organic matter can and, as it seems, does under certain conditions of ill-health dissolve it again; that is, while no irritation of ferments, or of the taking away of lime-salts, can affect the living matter, ill-health can make the vital force reduce the chemical combination of lime-salts with organic matter to a simple mixture more easily soluble for acids. All this belongs to a former period.

I have tried to avoid any allusion to the earnest endeavors of Dr.

Miller to explain the phenomena of caries on the theory that the organisms only run an acid factory and the acids destroy the teeth. But the immense importance which has been conceded to his work and, as it seems to me, the overestimation of its scientific value, so impresses me that I must notice a few of its inconsistencies. I will gladly concede all merited honor to an American scientist, and regret that I cannot agree with the *Independent Practitioner* in placing Dr. Miller at the head of the list of recent scientific discoverers. In studying Dr. Miller's papers I claim only the right of a juror to pass judgment upon expert testimony. The question in dispute between Underwood and Milles and Dr. Miller refers only to the methods by which bacteria produce caries—the former claiming as a matter of *opinion merely* that they do so by an acid which they create by feeding upon the living fibrils—the latter claiming to have *proved* that they produce the acid by feeding on food substance found in and upon the teeth.

Dr. Miller lays down this rule for the observance of investigators, viz: "It is not enough to guess the cause,or guess at it; we must *find* the *cause* and, having found it, *prove* that it is the one sought for." I will notice some of his assertions.

He says: "There are at least a score of acids possessing the power of extracting the lime-salts from the tooth in a high degree to be met with in the oral cavity under varying conditions. Consequently until some one by facts establishes a better theory we must look upon the theory of decalcification by acids as the accepted theory." This is proof number one.

Again: "There is no difficulty in accounting for the source of the acids concerned in the caries of the teeth. The saliva is impregnated with acids, * * * but by far the greater part in the decalcification is to be attributed to those acids which are produced in the mouth by fermentation."

Experiment: "Pieces of sound dentine placed in a mixture of saliva, bread, meat and sugar, became in ten days decalcified to the depth of half a millimeter. Numerous experiments of this nature showed a constant and powerful generation of acids. The conditions present in the experiment may always be found in the human mouth. (Not proved). Portions of food remain lodged between the teeth, or in fissures and depressions in the teeth, or in the cavities of decay, and lead to the production of acids sufficiently strong to at once attack the teeth." What an assertion is the following: "These conditions may always be found in the mouth." No constant change by the alkaline secretions, by masticating and drinking. No constant flow of saliva, but the mouth a closed vessel, like a corked bottle in the laboratory for ten days. What a wonder the teeth do not all disappear the first month after their eruption. Nature certainly made a great mistake in making such teeth for such a mouth. Such is proof number two.

Again: "Have bacteria the power either to penetrate or decalcify sound dentine?" Answer: "In not a single instance have I found them to pass beyond the softened dentine into the sound dentine?" Therefore they cannot penetrate the sound dentine. Underwood and Milles say they have so found them, but their investigations are of no account. They are only novices—have been only *seven years* investigating, while I have been nearly *three years*, besides doing a large dental practice. Besides, the dental canaliculi is $\frac{1}{25000}$ of an inch in diameter, while an average bacterium is $\frac{1}{4500}$ of an inch, and some are even less than half this size. The largest are $\frac{1}{10000}$ in diameter; therefore, being from one-half to one-tenth the size of the canaliculi, they have not the power either to enter or decalcify sound dentine. And, again, the canaliculi being filled with protoplasm and living matter, the bacteria would have nothing to live upon themselves or to give their rapidly increasing family.

Again: "We look upon caries of the teeth as consisting of three stages (1) decalcification," so that the bacteria can enter the tubuli, being one-fifth its diameter; (2) "infection and devitalization of the decalcified dentine," for of course they could not infect and devitalize the living matter until the lime-salts are removed so that they can gain entrance. "By decalcification I mean only the breaking up of the bond of union," and leaving a mixed up ruin. The bacteria could find their way so much easier into a trackless mass than through a well-organized structure, with open passways and nothing to hinder, but plenty of food. And, again: "I have adhered to the (old) acid theory of decalcification in this article, not because I regard it in any way competent to account for all the facts, but because it comes nearer to accounting for them than any theory yet proposed." *Quod erat demonstrandum.*

As a juror, I am not surprised that the judge decides the evidence to be incompetent and that there is no case before the court.

In Dr. Miller's final summing up of what he has done, I find the following:

"I proved at the same time that the invasion of the micro-organisms was not in the majority of cases simultaneous with the softening of dentine, but that large areas of softened dentine could be found that contained no fungi. Of all those who examined my preparations in America, no one, whatever his theory, ever denied this fact. I conclude from this that the softening of the dentine went in advance of the invasion of the organisms."

The passing around of specimens from city to city, to be examined by men of no special attainments as microscopists, under instruments good, bad and medium, and then concluding, because no one ever once denied his claim, "that the softening of the dentine went in advance of the invasion," is the weakest kind of negative evidence. I happened to be present with several others, two of them good microscopists, when some of those slides were under examination. The unanimous decision was that with the instrument in use, which was called a good one, no judgment could be formed.

It is unfortunate for Dr. Miller that he has to depend so largely upon negative testimony. He also takes too many things to be granted: For instance that he understands the true anatomy of the teeth; that he knows that there can be no reaction of the vital structure; that the organisms can produce no other substance which can "destroy the equilibrium;" that the organisms cannot act as a "true ferment in abstracting oxygen from the tissue, when deprived of air,' (Pasteur) etc., as testified to by the authors I have quoted. Also that he has produced the conditions found in the living mouth sufficiently similar to give reliable evidence to the results he has obtained. Having admitted the necessity of organisms and bread and butter for the production of acids, he ignores any further need of physiological processes of vital chemistry in breaking up the "bond of union." In other words, caries is a chemical injury, not a disease. He squarely presents this issue, the outcome of which will be watched with interest. The position is strongly suggestive of the story of the bull and the locomotive.

In the language of Zeigler, "When we can define a disease, not according to its symptoms or its morbid anatomy but strictly by referring it to its causes, we shall gain far more than a comprehension of the affection; we shall have done much to settle the therapeutic treatment."

Dr. Miller is to be congratulated that, acting in accordance with this statement, he has been seeking agents destructive to organisms, thus admitting the truth of the germ theory of dental caries.

I will close this brief notice of the papers of Dr. Miller with a fitting paragraph from Gradle:

"If we were to drop our acquired medical notions, and were to approach the study of disease from the standpoint of the modern naturalist, the germ theory would present itself in a more attractive light. Throughout nature every species of living beings struggles for its existence with all other beings with which it comes in immediate contact. In numerous instances this struggle amounts to the preying of a smaller species upon the body of larger creatures, the former deriving from the organism of their host their means of subsistence."

There is little to be said about the gross chemical theory of caries, so long accepted under protest. That the explanation it gives has been and is entirely unsatisfactory, is proved by the discussions which for many years have been going on, and the many attempts to find a better theory. Not until the investigations of Underwood and Milles were published was much progress made in solving the difficult problem. Dr. Miller has added hardly anything to their discoveries. Even if all he claims in regard to what organisms *do not do* shall eventually prove correct, it would still remain, as Underwood and Milles stated in 1881, that not only caries but suppuration of the pulp and alveolar abscess also depend upon *the successful working of organisms, and that the exclusion of germs* by the use of powerful antiseptics would prevent the *disease.*

Those who still seek an explanation in the gross acid theory are referred to a series of articles in the *Journal of the British Dental Association*, by Henry Sewill, M. R. C. S. and L. D. S., Eng. Only those of May and June have come to hand. These are full of old beliefs and opinions, based on former views of histology, and a rich spicing of sneers and ridicule aimed at those who believe in the vital reaction of the living matter in dentine. Thus far they contain nothing special in the line of new evidence.

In regard to the ability of the dentinal fibrils—or the bioplasson of Elsberg—to take on inflammatory action, it is sufficient to refer to the evidence seen in the effects of thermal changes following the introduction of a metallic filling, often continuing for months, and resulting in the death of the pulp; to the effects of drugs, such as chloride of zinc, alcohol, and other irritants, in producing their characteristic sensations: and especially in the effects of arsenic, when applied to *sensitive dentine*—a term long in use. The effect of this agent in causing inflammation and death of the pulp, when applied to periphery of dentine, is well known. Dr. Bodecker, in the *Dental Cosmos* Vol 25, page 505, has shown the inflammatory condition of the fibrils after the application of arsenic. Why, then, should it be doubted that the irritation produced by parasites feeding upon the fibrils should also set up inflammatory action? That this point will eventually be conceded by those who now ridicule, excepting some like the author of a recent book written to prove that the earth is flat, is as certain as that they are capable of intellectual progress.

At my request, Prof. Mayr has kindly permitted me to present his views of dental caries, given more fully than have been published elsewhere. His many friends will be interested in their perusal.

"The development and progress of caries appear to me at present, considerably modified by suggestions from dental friends, studies and discussions, from their first somewhat foggy shape, to go on in the following order:

First. A congenital defect in the enamel, not only a pit, a fissure, but within this pit or fissure an abnormal, imperfect foundation of enamel and enamel fibrils.

Second. The remaining of a particle of food in this pit.

Third. The presence of all kinds of germs in the mouth and their consequent immediate invasion of this remaining particle of food.

Fourth. The lively fermentation of this particle of food, laying bare by the resulting acids a certain amount of live matter in the enamel.

Fifth. The final death, from lack of proper circulation, of this weak live matter, and thereby irreparable loss of territory.

Sixth. The continuing process in this manner of killing the abnormal weak live matter, its consumption by the germs, etc., in the enamel, very often only within a few weak canaliculi, until the dentine is reached.

Seventh. The spread of the germs in the interzonal spaces by the withdrawal of nutriment from the fibrils of the bioplasson in them, hence starvation and death of the fibrils. They are then appropriated by the germs, at the same time food from without and within undergoing fermentation, as a secondary and remote process acid formation is going on, which dissolves lime-salts; the dead but not yet fermented zone is the intermediate zone.

Eighth. Entrance into those dental canaliculi which do not contain strong filaments, absorption of their pabulum by the germs, thereby death of the filaments, which are afterwards consumed by the germs; by the advance of the process in the weaker fibrillæ, also the stronger ones become finally weakened and a prey to the enemy; afterwards secondary solution of the lime-salts, etc.

Ninth. The interruption of the proper circulation in the destroyed canaliculi, absorption of pabulum by the germs, and death of parts of dentinal fibrils, causes the remoter parts to react, hence inflammatory processes in the more remote regions, throwing up of walls of lime-salts to keep the enemy out, pain to cause the patient to seek aid, etc.

Tenth. If not checked, the inflammation in the pulp reaches a stage where it becomes choked in its own stagnant circulation, death of the pulp, advance of the germs within the pulp cavity, but no dissolving of the tooth without saccharine food, because these germs cannot live on meat alone; at least they don't produce lime dissolving acids.

Eleventh. The tooth is not dead as long as cementum and pericementum are still alive; the enamel remains alive with exception of the invaded spot.

Twelfth. The carious, soft, decalcified old plug in a cavity teaches nothing whatever; it is the decayed corpse killed by a disease which has long ago run its course and which is active on the boundary between the healthy and the friable dentine; this plug is entirely a secondary product which has not as much connection with the process as the scab on a sore has with the sore."

In conclusion, I congratulate the dental profession on what has been done in this line of research during the last seven years. If I were to name the essential agencies more immediately connected with this good work, the names of Underwood and Milles and Prof. Heitzmann and his New York school, would stand foremost, never forgetting the great preparatory work of Pasteur and Lister.—*New England Journal of Dentistry.*

DENTAL SOCIETIES.

AMERICAN DENTAL ASSOCIATION.

TWENTY-FOURTH ANNUAL MEETING AT SARATOGA.

Reported for the ARCHIVES OF DENTISTRY by Prof. Chas. Mayr.

The meeting opened at 11 o'clock Tuesday, August 5, President E. T. Darby in the chair.

Prayer was offered by Rev. Dr. Cary of Saratoga.

After the calling of the roll it was voted to dispense with the reading of the minutes of the last meeting. The chairman of the committee on arrangements reported the programme as follows: Daily sessions from 9:30 A. M. to 2 P. M., and from 8 P. M. to adjournment.

It was on motion voted to have a clinical session Wednesday afternoon.

The Secretary, Dr. Cushing, reported amendments to the constitution, and asked unanimous consent for their immediate adoption. Section 2 of Article 6 to be so amended as to make it the duty of every permanent member to inform the Recording Secretary, before close of second day of the meeting, of the section which he desires to join. Other amendments provided for the early organization of the sections, the object of the whole being to secure a more perfect organization of the various sections. The amendments were unanimously adopted.

The President then read his annual address and upon motion of Dr. McKellops it was referred to a committee of five, consisting of Drs. Brown, Harlan, Taft, Foster and Pierce for special consid-ation and report.

In his address the President gave a short history of the organization of the association twenty-five years ago, and complimented those who had from the first taken an active interest in its proceedings. He called attention to the rapid progress that had been made in dentistry during the time this organization had been in existence, and spoke touchingly of the death of Dr. Buckingham, of Philadelphia. At the date of the organization of this society, 1859, the estimated number of dentists in this country was about

4,000; the number now exceeds 12,000. Dental societies have increased five fold, and dental colleges at a still more rapid rate. During the same time nineteen states have enacted laws regulating the practice of dentistry within their borders, while the enlargement of the literature of our profession has equaled our increase in numbers.

In speaking of Dental Education he urged the importance of a uniform system of preliminary examination, and lamented the absence of endowments of professorships so as to enable incumbents to devote their entire time to the work of instruction.

He paid a just tribute to the pioneers in Dental Education, and believed those who had undertaken its duties, as a labor of love, had frequently been unjustly censured by members of the association and others, while just praise for their unselfish labors had often been withheld.

He was pleased to note that an organized effort was now being made by the college faculties to raise the status of applicants for admission into the schools and also the standard of acquirement requisite for graduation. He exhorted the state examining boards to do all in their power towards sustaining the college faculties in their efforts at improvement, and alluded with much satisfaction to the scientific work, now being done by members of the profession in this country.

On motion of Dr. Ambler a committee of three was appointed to draft suitable resolutions relative to the death of Dr. T. L. Buckingham. The President appointed as such committee Drs. Ambler, Allen and Taft.

Dr. C. N. Pierce called attention to the fact that there would be an adjourned session of the meeting of the Faculties of the Dental Colleges during the afternoon.

Dr. Geo. H. Cushing, chairman, read the report of the Committee on Publication.

Dr. C. D. Cooke called attention to the fact that the names of a number of men were reported as members of sections who were not members of the Association.

The Secretary announced that he had retained the names of some who allowed their membership to lapse, but in every case he had reason to believe it was through inadvertence, and not from a desire to withdraw from the Society. Adjourned.

TUESDAY EVENING SESSION.

The meeting was called to order by the President.

It was voted that Wednesday evening's session be devoted to the paper on Histology, by Dr. J. L. Williams, of New Haven, Conn., with its stereopticon illustrations.

Section VI., "Pathology, Therapeutics and Materia Medica," was then called, and the report was presented by the chairman, Dr. A. W. Harlan. The subject was Pyorrhea Alveolaris. The author said that the report was but a continuation of the paper of last year, bringing out details suggested by numerous inquiries. He was gratified to know that his efforts have been so spontaneously recognized, and expressed his acknowledgment. Many in the profession are liable to confound salivary deposits on the lower incisors or on the palatal or labial surfaces of molars with pyorrhea alveolaris. These are only in a slight degree the cause of, or associated with, this affection. In all cases of abundant discharge there may be observed a loss of tissue around the teeth, whereby their symmetrical outline becomes irregular, and this finally leads to extensive destruction of the bone.

It is not a disease of old age, any more than of youth or middle age. I have seen it as early as the ninth year, and several times before the sixteenth year. My experience leads me to think that between the ages of twenty-five and forty it is most frequent. Pulpless teeth do not escape the ravages; users of tobacco are not less liable to attack than those who abstain. In the course of the disease the teeth twist, change position, and protrude. If thoughtlessly extracted, the features may be greatly altered. The fact remains that a vast majority of cases is unaccompanied with salivary calculus. In most cases the gums have a purplish color, corresponding to the shape of the pockets. As regards the treatment, experience has shown the necessity for the use of instruments of extreme delicacy to examine the pockets for sanguinary deposits, etc.; if salivary calculus is found, it should be carefully removed and the case treated with the following preparation:

Pinus canadensis,	½ oz.
Aqua rosae,	1 oz.
Eugenol,	30 drops.

to be applied twice daily.

To remove the calculus I use Cushing's scalers, necessitating a pushing motion. In addition, two or three properly shaped excavators are necessary to scrape the edge of the alveolus. A fine pointed syringe is needed, the point not too sharp, with the opening near instead of at the point. $H_2 O_2$ (hydrogen peroxide) ought to be injected immediately after removal of deposits or excision of the edges of the processes. I use also iodide of zinc in solution, three to forty-eight grains to one ounce of water, and begin by the injection of three to four drops into each pocket, after the injection of the $H_2 O_2$. I have also used Eugenol and Sanitas oil in place of hydrogen peroxide. I direct my patients to brush the gums with a stiff brush, and discontinue the use of the pinus canadensis after the beginning of the treatment of the pockets. Loose teeth are bound together with binding wire of silver, platinum, or gold. When the suppuration ceases, the injection of hydrogen peroxide is discontinued, and a dentifrice of the following formula employed:

Precipitated chalk,	2 oz.
Orris root,	2 oz.
Castile soap,	½ oz.
Powdered borax,	½ oz.
Powdered myrrh,	½ oz.

Glycerine and honey, enough to form a paste.

If desired, I add about twenty drops of eugenol. After the fourth or fifth visit the interval may be longer; once a week, and so gradually increased. As stated before, in all cases of pyorrheæ with pain, iodoform made into a paste with oil of cinnamon and oil of eugenol is an excellent local anæsthetic. I have also had good results from injection of a weak solution of chloride of alumina, one to two grains to one ounce of water. Iodo-chloride of zinc, a saturated solution of iodine, wood creasote, iodoform, eucalyptol, a diluted alcoholic solution of menthol, have also been used, but I prefer the first mentioned remedies.

The second portion of the report was upon the qualities and character of eugenol and oil sanitas. Eugenol is the essential principle of oil of cloves.

It is known among chemists and in the dispensatories as eugenic acid. It is prepared by decomposing eugenate of potassium with sulphuric acid; it is then rectified. An oil of low specific gravity is obtained. It has the odor of the oil of cloves and the composition $C_{10} H_{12} O_2$. It is not decomposed at ordinary temperature, has no tendency to become thick on exposure to air,or to precipitate a sediment. It may be diluted with water or alcohol. It is a powerful parasiticide. When applied to an exposed pulp, the pain is greatly reduced, and soon ceases altogether. If the cavity is previously washed with biborate of soda, it is probably the best dressing for slightly inflamed pulps, not excepting tho various iodoform pastes. It may be injected into fistulous tracts, and the cavity sealed immediately. I have injected three drops into the interior of an epulis, and in three weeks it has disappeared. As an injection into the root it should supersede all the powerful coagulators; diluted with water to 1,000, it forms an agreeable dressing, and may be substituted for $H_2 O_2$. With proper precaution it may be injected full strength into an abscess without danger.

Sanitas oil is obtained by the oxidation of oil of turpentine. It is produced from turpentine floating on water. by directing a stream of heated air on its surface. It contains an empyreumatic oil, and a substance probably identical with $H_2 O_2$. It possesses oxidizing power equal to a ten volume solution of $H_2 O_2$, and may be considered as a convenient method of storing it. In it we have a germicide of the first rank. Combined with volatile oils, it gives a dressing which is disinfecting, antiseptic and not poisonous. It has the odor of fresh pines, which may be disguised by oil of gaultheria, eugenol, or eucalyptus, but a large volume is needed. It has been used for injection into the pyorrhea pockets, in the treatment of alveolar abscess, and as an ingredient of mouth washes for the treatment of recent wounds, and as a dressing over exposed pulps. It is soluble in alcohol and ether, and some of the essential oils. Eugenol may be procured from Seward and Merks, while Sanitas is made by the Sanitas Company, in London,England, and is imported by Sargent, Chicago.

DISCUSSION.

Dr. Odell.—That is what I call a good paper. The author does not mention manipulation of the gums, and depends upon the drugs to do the whole work. I have had two cases, one quite recent,where manipulation seemed to be the only thing of benefit. This was supplemented by the action of the galvanic current. I came to the conclusion that it was a sort of necrosis.

Dr. Bogue.—Why does Dr. Harlan recommend Canada Balsam at a certain stage? Can he give the rationale? And why at another point precipitated chalk and powdered myrrh?

Dr. Harlan.—The treatment with Canada balsam is before the beginning of the systemic treatment; perhaps no particular benefit is derived from the myrrh in the small quantity used, but it may disguise the taste of other things that might be disagreeable to the patient. The form of a paste seems to have the advantage of not lodging between the teeth.

Dr. Bogue.—It does not seem consistent after removing deposits to use remedies which, *ex necessitate rei*, must produce deposits. The substances mentioned are precipitated by water, and the effect must be to render the teeth sticky and unclean. I have noticed for many years a tendency to prescribe tincture of myrrh, but never found what it was for, and never saw the least benefit from it.

Dr. Harlan.—I have used the paste myself and never became conscious of a deposit on my own teeth and gums. I think the patient will brush away much more completely the paste than the powder.

Dr. Barrett.—With the exception of dental caries, none of the diseases of the teeth come more frequently under our treatment than does pyorrhœa alveolaris. Only when we shall understand its etiology will we be enabled to speak intelligently about its therapeutics. Is it an affection of the membranes of the tooth? Is it in the alveolus? Is it confined to the periosteal membrane? Does it arise from constitutional disturbance, or is it merely local and incidental? All these questions must be answered before the practitioner is fully qualified to enter upon its treatment. The cases that have caused me the greater anxiety have been those in which astringents, or cauterants, or any other class of remedies was not sufficient to reach the source of the disease. In one obstinate case recently under treatment I was obliged to make repeated surgical operations until I had thoroughly removed nearly all the border of the alveolus about the affected teeth. I believe a concomitant, at least, of severe cases, is a kind of caries of the alveolar edges. It cannot be called a necrosis, for there is no sequestrum, but it is a disintegration of the septa and walls, due perhaps to a periodontal inflammation. I never had any success in treatment, until I had established a clear line of demarkation; the after treatment was then only palliative. The remedy that I have found most efficacious has been chloride of zinc. The stimulating effects of this preparation in the formation of healthy granulations are too well known to need argument. I know of nothing that possessses these virtues in so great a degree. After the surgical operation I usually apply aromatic sulphuric acid in full strength, and the subsequent treatment consists in the application of a solution of chloride of zinc in such strength as the case seems to demand.

Dr. Atkinson.—This subject is highly interesting, because it involves the principles underlying the destruction and reproduction of the tissues. Few of us distinguish sufficiently between and escharotic, a stimulant, and a tonic.

All these agents have the direct influence of coagulating the albuminous portion of the tissues at the particular point,so that, by the operation of the laws of function, new tissues can be formed. But what will occur after this process of coagulation of the albuminous tissues? It is the retrogressive metamorphosis of the layer of tissue immediately underneath that which has been coagulated. The first step is .one of retrogessive metamorphosis, or return to embryonal conditions, and after this the type produces the tissue belonging to the parts by repeating the action of the functional movements that first resisted destruction.

The point of strength of solutions is very important; twenty grains of chloride of zinc to an ounce gives that degree of coagulation that will be analogous to that coagulation that takes place in the evolution of the chicken from the impregnated egg, that suited to the fibrillated condition of the lymph. Aromatic sulphuric acid and aqua regia, one part to seven parts of water, are best suited for that retrogression that is called wasting of the dentinal ligaments; it is a local disease, which occurs many times on only a single tooth; it will start from the margin of the gum, from the point where the dentinal ligament attaches and go to the end of the root without involving enough to approach the transverse processes; and the teeth most liable are the cuspids. Where there is no deposit, either salivary, seruminal, or sanguinary, I doubt the propriety of mechanical interference. I agree, to a certain extent, with Dr. Bogue in what he said about the deposit of myrrh. When water enough is added to take hold of the alcohal in the solution of myrrh, it is precipitated.

Dr.L. D. Shepherd, Boston, recited a case which was brought to him by a surgeon and which proved to be one of pronounced pyorrhea. The patient was suffering from a specific disease, and the severe ptyalism present had been produced by the use of mercury and had continued three months. This mercurial treatment had been discontinued, yet the salivation persisted, not having yielded to the ordinary remedies.

There was but little deposit under the gums, but pus exuded freely on pressure and the discharge was so profuse at night as to leave a large stain upon the pillow.

The treatment consisted of the removal of the slight deposit, and of syringing with dilute sulphuric acid solution, resulting in a cure in about two weeks, when the exhibition of mercury was resumed without a return of salivation. The rapid cure of this case served to confirm him in the opinion held for several years that the disease is chiefly local, and in a great majority of cases curable by surgical treatment alone, that is without medicine, or at most with the slight stimulation afforded by dilute sulphuric acid.

Conditions arising from the accumulation of salivary calculus are entirely distinct from pyorrhea. Light on the pathology of this disease is greatly needed. Recently a case came under his observation which was treated nine years ago. The subject is now seventy years of age, yet with one or two exceptions, where the teeth have been removed, all the teeth are now firm and useful. Pyorrhea is sometimes seen where there are no deposits upon the teeth, and it seems important that the point should be clearly stated that salivary concretions are not *per se* the cause of this affection.

Dr. C. N. Pierce, Philadelphia.—My experience has been directly adverse to that of the previous speakers. A condition resembling this disease, often met with in the mouths of children I do not believe is pyorrhea alveolaris. Accompanying or preceding this disease,I find almost invariably there is recession and calcification of the pulp, and the filling up of the tubuli of the dentine. I think these conditions of induration precede the active stage of the disease under consideration. So strong has been this conviction that I have been led to open into the pulp chamber of the tooth most affected and destroy the pulp in the hope of arresting the further progress of the disease. In this I have been disappointed. Have always found the teeth in this condition in patients suffering from urinary calculus, and so constant has been this relation that I have come to regard the pyorrhea as an expression of the constitutional condition that produces urinary calculus.

Have never seen a case of true pyorrhea alveolaris cured, and believe the alleged cases that have been claimed to be cured by local treatment only, were not what I should call pyorrhea. By careful management teeth affected by this disease can be made useful for five, ten or fifteen years, and when teeth are partially lifted from their sockets they may be ground off and supported by wire and retained for several years; but such teeth must be constantly watched and undergo frequent treatment.

Dr. M. L. Rhein, New York, attributed the lack of success in the treatment of this disease to a lack of knowledge of its etiology. He had noticed the symptoms described by Dr. Pierce, but their indications were not the same to his mind. On the discontinuance of constitutional treatment he had seen a return of the disease, but whether the recurrence was due to a suspension of treatment or to lack of cleanliness on the part of the patient he could not say. Think it probable there are different forms of pyorrhea alveolaris.

Dr. Geo. L. Field, Detroit, asked that the difference between the deposits of pyorrhea and those of the saliva be more clearly defined. There is a difference in color, those of pyorrhea being usually darker, but as this latter had not been analyzed that he knew of, there was much difficulty in distinguishing their differences. It was hard to tell where one left off and the other began. If there was anything on this point he should like to know it, for there was nothing in dental practice that he felt so incompetent to manage as this disease.

Dr. Odell remarked that the ind:screet use of so potent a remedy as aromatic sulphuric acid might work great injury. A patient of his to whom he had entrusted its application had by its too free use destroyed the pericementum on two central incisors. He looked upon zinc chloride as, if possible, a still more dangerous drug, in incautious hands.

Dr. W. W. Allport, Chicago, spoke in favor of the effects of eugenol when applied to exposed or nearly exposed pulps, and also as an injection into alveolar abscesses. He had also used it successfully in a case of cutaneous eruption which had resisted medical treatment, by ordinary means. The distinction between pyorrhea and the disease caused by salivary calculus is very distinctly marked. In the former, constitutional treatment is necessary to complete success in a large majority of cases, while in the latter surgical treatment is all that is required. Pyorrhea occurs with some of our most careful patients, and he saw no reason why it should appear in any locality unless it was an outward expression of an internal cause. He had noticed what had already been mentioned by Professor Pierce and others, that pyorrheal patients were often troubled with diseases of the urinary organs, and when successfully treated for these diseases, this disease of the alveoli was alleviated and sometimes disappeared. To talk of curing this disease by local treatment only, was folly. He had found eugenol an excellent local application, for in addition to being an active germicide,—as good as any perhaps—it is also a stimulant. The same may be said of most of the chlorides which are also coagulants. These are the essential properties of the remedies for local application. But whatever remedy we use, let us know why we use it, and not employ it because some one else has.

Dr. James Truman, Philadelphia, approved the views contained in Dr. Harlan's paper, relative to the distinction between the deposits in pyorrhea and those commonly called tartar. Ever since the French writers gave this disease its name and Magitot had announced chromic acid as the local remedy, he had been investigating its nature and its treatment. To ascribe it to the presence of tartar was absurd, and yet he looked upon it as a local affection aggravated by constitutional conditions, similar to an alveolar abscess transferred from the apex of the root of a tooth to its neck.

Pus is developed from irritation or inflamation of the pericementum, and to treat the disease successfully we must treat the pericemental tissue, and first by a destruction of germs. To cut and slash for the cure of this disease is one of the barbarisms of old dentistry. He had successfully employed pure sulphuric acid largely diluted, followed by soda bi-carbonate as a local application, and quinia sulph. internally for its effect in hindering the movements of leucocytes and thus preventing inflamation. As a mouth wash he prescribed a solution of thymol.

Adjourned till Wednesday.

[TO BE CONTINUED.]

OMNIS PENIS EMPLASTRUM PERFORATA translated by the *Southern Clinic* becomes Allcock's Porous Plaster.

THE TWENTIETH ANNUAL MEETING OF THE ILLINOIS STATE DENTAL SOCIETY.

Reported Expressly for the ARCHIVES OF DENTISTRY.

[CONCLUDED FROM PAGE 357.]

FRIDAY, MAY 16TH.

DENTAL EDUCATION.

The paper announced in the programme on this subject was not read. and Dr. Cushing opened the discussion by first alluding to the embarrassment under which he labored in the absence of a paper on which to base his remarks,but he nevertheless proceeded to say that the tendency of specialties sometimes made men move in narrow grooves. The true professional man should be as broad as his mental capacity would permit.

In his view dental education should be discussed with reference to the future. He urged higher, more advanced standards in educational requirements. He said:

"It is due to the profession that this should be done. Thoughtful men have long seen the necessity of it. The present outlook is encouraging because of this recognition.

Prof. J. Taft further discussed the topic. He said we ought all to be ready to encourage advanced dental education. The work of a society itself is educational. In one sense it is a school of instruction. The subject of education is one of the most outreaching subjects. It not only affects the profession at present, but reaches out into the future. It is less important now than what it will be in the future. We work for the future. The position taken to-day governs the future. What are the points most to be considered in this connection?

The first is preliminary education. We need a more thorough, comprehensive preliminary education for the future dentist. It is admitted that the educated man is more influential in our profession, and in the community at large. He wields a greater influence.

The matter of education presents these two necessities:

1. The training of the mind.
2. The accumulation of knowledge, which is the sequence of the other.

The training of the Dental College curriculum comes easier if there is a superstructure of elementary education to build on.

Those thoroughly grounded in fundamental knowledge more easily acquire and accumulate knowledge of higher and special branches. Those who have no knowledge of the classics are at a disadvantage in professional study. They have to utilize their memory to acquire the meaning of words while the classical scholar knows the origin and significance of what he reads.

Our college curriculum advances with time in comprehensiveness and in more thorough training, but it only lays the foundation for the work of the future. Within a few years greater attention has been paid to histological and other scientific features.

There are hangers on yet, who are unfit for dental representation, but let us not lament this, but have a care of whom we admit in the future. Preceptors in offices, rather than college authorities, should care for the students, to guide them right.

The profession in the future will be what you make it now; for the profession is responsible for its own character.

In conclusion he urged that provision be made for Post-Graduates to carry on their future studies.

On the invitation of a committee composed of Drs. Black and Kitchen, his excellency Gov. Hamilton visited the society, and made a short address, in which he said that the State of Illinois had done and was still doing much to foster professional education, and that he was in full sympathy with that effort.

IRREGULARITIES IN HUMAN TEETH.

Dr. J. J. R. Patrick then read his paper on Irregularities in Human Teeth, or Dental Teratology

He insisted at the outset, that practical education in dentistry is better than theory. The authors of papers in some of the dental journals and in society transactions were continually showing their unlimited confidence in their own ability, based upon limited observation of the different branches of natural science.

He proposed showing some irregularities in human teeth from which the lower animals are exempt. In this connection he would review, somewhat, the science of monstrosities, showing that no monstrosities could result except where mal-conditions existed. He would consider anatomical and physiological laws as the startling result of investigations, showing in some cases the absolute absence of brain; in others a vascular system without even the rudiment of a heart.

He insisted that what is true of the abnormal development of the whole body is true of any part; and an excess of development in one part is balanced by the non-development of others. There are peculiarities in some mouths. Here for instance (showing a cast) is evident a total lack of the maxillary bone. The lateral development is here wanting. The cast is that of the mouth of a young lady twenty-two years old.

Sometimes that which is normal in the lower order of animals is abnormal in man.

In some cases as here (illustrating) the incisors are too far apart owing to the unusual thickness of the septum. Some have patches devoid of enamel like this (showing a specimen), and others have patches of enamel on the cervical border and even on the roots. The roots of the individual teeth often present singular phenomena in respect to irregularities and confusion. Here are specimens(they were passed around) showing fused and confused molars.

The fusion of molars can only take place in the roots.

Supernumerary teeth may become confused with true molars or with bicuspids.

This takes place only under the supposition that nature has provided a common primary cell for two germs, for the confusion of the crowns would have to take place in the germs before the enamel organ became calcified. Canines do not become confused with lateral incisors, for the reason that the germs of these teeth originate in the maxilla proper and the sutures of the intermaxillary bone interpose to prevent fusion with the laterals. For the same reason, that is the occurrence of the median suture, the centrals are never united with each other. Here are central and lateral incisors confused,but they never fuse as do the molars. Bicuspids, too, are sometimes found confused, but are never conjoined at the roots.

A deficiency of roots is sometimes found, and when there is an excess of roots there is a corresponding excess of cells. Canines are occasionally found with two roots perfect, as in this specimen(showing it). The front and lateral incisors very rarely bear two roots.

The relative proportion of crown and root of teeth is rarely maintained, teeth with long or large crowns having short roots, while those that have low or short crowns have long roots. Great care should be observed in shifting such teeth, for teeth with long roots require more time to place them in a new position, while those having short roots and long crowns owing to the greater leverage afforded by the crown, are liable to be lifted out of their sockets.

These charts here(pointing them out)show the conformation of the walls of the inferior maxillary. The molars you will observe have an outward inclination, owing to the internal thin wall and the external thick wall. This latter is reinforced in this region by the external oblique ridge. From one second bicuspid to the other the front external wall is thinner and weaker than the internal. Consequently the point of weakness in the lower jaw is at the second bicuspids, where the lines of strength and weakness intersect and here is where the fracture of the lower jaw usually takes place. In extracting the teeth should be inclined toward the thinner wall.

Dr. Brophy.—Is the jaw not weakened at this point by the presence of the large roots of the first molar?

Dr. Patrick.—Yes; of course. The speaker traced the development of the teeth from the follicular up to the completed stage, illustrating at the same time the coincident development of the maxillary bones. He said the deciduous teeth, on account of their soft and porous nature, and the thinness of enamel, are readily permeated by fluids, and for this reason are subject to early decay. The pulp chambers of these teeth being proportionately larger than are those of the permanent set, increases the liability to exposure of the pulp in these teeth and the resulting difficulties that stand in the way of their preservation. He urged the importance of preserving the deciduous teeth, giving as one reason therefor, that if extracted several years before the time for their successors to appear, the cells of the extracted teeth would fill with osseous matter and cause the succeeding teeth to diverge from their proper course and make their exit through either the external or the internal wall of the alveoli.

In summing up this highly interesting paper Dr. P. mentioned the fact that no two cases of irregularity of the teeth were exactly alike, for the reason that the surrounding circumstances were not the same, and that therefore no definite rules could be given which were of universal application. Yet there were certain facts and principles connected with the process of regulation that must be studied and observed. If teeth are diverted by the mechanical forces of nature, it is evident that they may be brought into their normal positions by mechanical means, intelligently applied. If the diversion was a gradual process, replacement should also be expected to require time for its accomplishment. Until the calcification of the roots of teeth is complete, which in the incisors and canines is not until the tenth or eleventh year of age, the movement of such teeth, with a view to mechanical regulation, should be postponed until after that age. The condition of the cusps of the incisor teeth may be taken as a fair indication of the condition of the roots. So long as the notches or cusps remain on these teeth the calcification of the roots is incomplete. A similar observation of the canines will serve as a guide to the condition of their roots also. All devices for the shifting of teeth should be simple in design, that they may be easily understood and applied. They should have two points of action on teeth that are not to be moved, and one on the tooth that is to be moved. In his opinion the necessity for extraction of teeth to correct irregularity is of rare occurrence, and hence it is best to defer extraction until the the case has been thoroughly studied.

Dr. W. B. Ames, of Chicago, read a paper on "Some Applications of Electrolysis in Dentistry."

He said that the chemical effeects of statical electricity were first investigated in 1784 by Priestly and Cavendish.

Water was first decomposed by means of statical electricity in 1789, but the decomposition of water by the galvanic current was first described by Nicholson & Carlyle in 1800. Sir Humphrey Davy lectured on the chemical agencies of electricity in 1806, and in 1807 announced the decomposition of the fixed alkalies by the same agency. The period between 1831 and 1840 was notable for the experiments of Faraday, who then introduced the system of nomenclature now in use.

Electrolysis affords the best means of determining the true character of electricity. By electrolysis bodies are decomposed in exactly the same proportion in which they combine. According to Miller an electrolyte must consist of a combination of a conductor and a non-conductor, and most electrolytes are thus composed.

The uses of electrolysis in medicine are limited to the removal of morbid growths. In dentistry, this process applied to electrotyping and electro-plating, may be made useful for a variety of purposes. A shell of copper may be thrown upon a plaster model and used in moulding celluloid. Crowns of platinum may be plated with gold, and 18-carat gold plates may be electro-plated with pure metal and thus corrosion in the mouth prevented. The bleaching of natural teeth by any safe chemical process is necessarily slow, yet by the aid of electricity it may be done quickly and with safety when proper care is exercised. Peroxide of hydrogen is a bleaching agent of great power as is shown by its effect in bleaching hair, and by means of electrolysis its equivalent can be readily manufactured in the tooth to be bleached.

Ozone is intensified oxygen,and one volume of it will it is estimated purify three million volumes of putrid air. Thus it is seen that by the evolution of nascent oxygen. or ozone, within the putrid mass, it may be quickly and thoroughly disinfected. This may be done within the pulp chamber in the presence of the putrid pulp. By this method of disinfection decomposed pulps may be removed without fear of bad results.

Dr. C. R. E. Koch, of Chicago, read an essay entitled, "The Illinois State Dental Society. What has it accomplished?" Giving a history of the Society from the beginning on July 24, 1865, up to the present time. Many incidents connected with the proceedings of the Society during the nineteen years of its existence were related,and comparisons were made showing the remarkable growth of this Society both in numbers and in usefulness and influence, all of which was attributed to the harmonious and unselfish action of its members.

During the meeting the society visited the Lincoln homestead. The home is filled with a collection of pictures, publications and other articles which have a historic interest and which serve to perpetuate the memory of President Lincoln.

The following is the list of the officers of the society for the year ending in May 1885:

President, - - - - - H. H. Townsend, Pontiac.
Vice President, - - - Mark H. Patten, Springfield.
Secretary, - - - J. W. Wassall, 103 State St., Chicago.
Assistant Secretary, - - - - P. J. Kester, Chicago.
Treasurer, - - - - - C. R. Dwight, Danville.
Librarian, - - - - J. W. Cormany, Mount Carroll.

EXECUTIVE COMMITTEE.

D. J. Pollock, - - - - - - - - Sterling.
C. F. Matteson, - - - - - - - - Chicago.
W. C. Martin, - - - - - - - - Peoria.

BOARD OF EXAMINERS.

E. D. Swain, - - - - - - - - Chicago.
T. L. Gilmer, - - - - - - - - Quincy.
Garrett Newkirk. - - - - - - - Chicago.

PUBLICATION COMMITTEE.

J. W. Wassall,	Chicago.
P. J. Kester,	Chicago.

COMMITTEE ON INFRACTION OF THE CODE OF ETHICS.

Jas. G. Reid,	Chicago.
M. T. Hand,	Joliet.
E. Duncan,	Jacksonville.

SUPERVISOR OF CLINICS.

Frank H. Gardiner,	Chicago.

At this meeting of the Illinois Society Dr. J. G.Templeton, of Pittsburgh, Pa., exhibited an articulating model into which a diaphragm of plaster had been introduced. The object of the diaphragm is to facilitate the arrangement of the lower half of a double set of teeth: the length of the lower teeth being controlled by coming in contact with the under surface of the diaphragm, and the outline of the teeth being made to agree with the outline of the diaphragm, which had been previously trimmed to the desired shape. It is claimed that absolute accuracy can be more quickly attained by the use of this diaphragm than in the ordinary way. The following is Dr. Templeton's description of the process:

It is possible for any dentist of ordinary ability to acquire the knowledge and skill in mechanical manipulation, that will secure to him such precision and accuracy in articulating entire sets of artificial teeth, that failure in the final result will be of rare occurrence.

After securing the bite in the usual way and having secured the models on a metallic articulator, proceed to make wax plates or models for the purpose of determining contour and adjustment of the teeth so that the force of mastication, will be exerted in the proper direction and the exact length of the teeth and the line of occlusion of upper and lower teeth will be determined. When thus arranged on the metallic articulator, try the wax models in the mouth, and if any changes are necessary they can now be made; being careful to notice that the wax models shall occlude in the mouth the same as on the articulator and also that there is the proper restoration of expression when the lips are closed over the wax. Everything being satisfactory thus far, we are now ready to make the plaster articulator which is done by removing both plaster models from the metallic articulator and attaching plaster to the back end of the lower model so as to extend its length one inch and three-fourths. Trim and cut grooves in the extension, coat the surface with lard, then place the wax models together in their proper relation to each other the same as when tried in the mouth. Now place the wax model of lower set on plaster model of lower jaw having wax model for upper set attached. Next place model of upper jaw in its place in the wax mould, then build on the plaster extension to articulate with that of lower half which is to be trimmed to the same shape, and as soon as the plaster has set the two parts can be separated; after which place the lower wax model on the cast of the lower jaw give the articulating extension a thin coating of lard and cover the whole surface with plaster three eighths of an inch in thickness which will make a blank or diaphragm which must be trimed to conform to the contour or outer surface of wax model. After this, separate it from the lower model of wax and plaster and proceed to adjust the trial plate of wax of lower model and arrange the teeth thereon. Replace the diaphragm which will serve as an accurate guide to the height and position of all the lower teeth. This done remove the diaphragm and replace the upper half of the plaster articulator, and arrange the upper teeth.

After waxing up, saw off the projecting portion of the plaster articulator and the cases are ready for the flask, or for investment.

JOURNALISTIC.

"Reading maketh a full man: conference, a ready man: and writing, an exact man."

TIN AND GOLD COMBINED AS A FILLING MATERIAL, ELECTRICALLY AND PRACTICALLY CONSIDERED.—By W. D. Miller, Berlin. This is the first article in *The Independent Practitioner* for August. "It is not known who first ventured to use a combination of tin and gold for filling teeth. About eighteen years ago a gentleman called upon Dr. Abbott, Berlin, to have his teeth examined. In one of them the Doctor found a discolored filling, having the appearance of amalgam, and remarked that it was the best amalgam filling he had ever seen, to which it was replied that the filling consisted not of amalgam, but of a mixture of tin and gold foils. Since that time Dr. Abbott has used this filling material in his practice very extensively, and in former years strongly recommended it to the profession. It has, however, been adopted by only a limited number, owing, no doubt, in part, to the prevalence of a wide spread superstition that the electricity attendant upon such a filling will in some way or other be injurious to the teeth. The electrical conditions connected with a filling of this nature can be understood only when the arrangement of the two materials in the filling is perfectly appreciated. The material is prepared by laying from one-sixth to one-third of a sheet of No. 4 non-cohesive (Abbey) gold foil upon a similar slip of No. 4 tin foil, and twisting between the fingers into a soft crumpled roll. It is immaterial whether the tin or the gold is on the outside. Some prefer the former; others the latter." * * * "These rolls are worked in the same manner as strips of non-cohesive foil, or they may be cut into pellets and worked as non-cohesive cylinders." "It may be inserted with ease and rapidity scarcely equaled by any material in use." * * * "If we remove the surface from an old tg (tin and gold) filling, we will find beneath neither tin nor gold, but a semi-crystalline mass which it is sometimes impossible to distinguish from amalgam."

To recapitulate. Tin and gold used in the manner advocated by Dr. Abbott, owes its virtues to the ease and rapidity with which it may be inserted, to its marked adaptability; to its freedom from injury by moisture, and to its slight expansion after insertion. It does not owe its any virtue to any supposed electrical action upon the tooth itself."

PROGRESS IN SCIENTIFIC AND ARTISTIC DENTISTRY. By Dr. E. Parsons, Savannah, Ga. Read before the Georgia State Dental Society and published in the *Dental Luminary*.

"In conclusion, I present the following aphorisms, which will benefit all who heed them:

1. There can be no progress in scientific and artistic dentistry without study, observation and experiment.

2. An aversion to any kind of labor is a double tax on the nervous system of the performer, and the only possible satisfaction is the remuneration received for it.

3. Without a love for a chosen profession, opportunities for improvement are neglected, no progress made; what is done is from necessity, and not from any pleasure therein.

4. A laudable ambition to excel in what we undertake to do is the high road to eminence, and always deserves success.

5. To make this life a happy one, the golden rule should be our guide in all we do.

6. Dissipation and debt are the two greatest enemies to human happiness; always avoid them." H.

EDITORIAL.

If we examined the origin and significance of this word much light may be gained.

In its rootal sense it signifies to give out, to do which, the editor must possess it.

What is the possession if it be not knowledge, which is possessing or holding of *truth* in any department of her infinite domain.

This holding may be righteous and it may be unrighteous. A righteous holding of truth is such a getting as shall conform to directness of reception, elaboration and laying up of her formulæ for use. The uses of truth are societary, its attainment is individual and segregatory, hence to be held in righteousness it must be held as a common and not an individual possession.

A knowledge of the truth cannot be full so long as it is held as mine and thine. It is and must be OURS!!! Words cannot be useful until they are righteously put together, hence the duty of editors is to see that faith and works go hand in hand in giving out the treasures of wisdom, knowlegde and affection.

In fact wisdom consists of a balancing of affection and knowledge in such approximation of equality as to perpetuate an alternate predominance and subdominance of lead. Completeness of lead is subjugation and hence unrighteousness.

Affection and knowledge are the feet, the alternate use of which bring us to wisdom, and correspond to faith and works in human career.

It is a great error for teachers to assert the possibility for knowing all there is in any category of knowledge, science, art or interest. They should stimulate interest by amplification, variation and specialization of all these departments. Just as soon as any activity becomes uninterestiug it should be exchanged for one more engaging.

THE

Archives of Dentistry.

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ORIGINAL ARTICLES.

> **"Of all the arts in which the wise excel,**
> **Nature's chief masterpiece is writing well."**

LOOSE INFERIOR INCISORS AND THEIR TREATMENT.

BY J. HARDMAN, D. D. S., MUSCATINE, IOWA.

Read before the Iowa State Dental Society, May, 1884.

Every dentist of a few year's practice can appreciate the importance of this subject.

Mr. A. or Madame B. has appealed to us for relief,where the attempt to masticate has become nearly intolerable. And with endurance exhausted, and a conviction that but an only alternative remains, requests the immediate removal of the unbearable tooth. In such cases one, or perhaps more of the lower incisors are quite loose, sore, and more or less elevated from the socket; and we observe, too, it can be oscilated to and fro in an arc, often exceeding one fourth of an inch. It is at once apparent what a great source of agonizing torture the act of mastication must be. The uncer tainty of the tooth's position; the liability to be violently occluded upon by the upper antagonist; the superinduced sensitiveness of adjoining tissue—all go to make the function of mastication a dread, and an almost entire impossibility.

And we need not be reminded how generally in these cases the practitioner proceeds to remove the tooth or teeth and thus secure an abatement of the immediate suffering. Or, if an attempt at retaining and treating is concluded upon, it has not been found to afford, at best, but temporary relief. The tartar is removed, the gums therapeutically treated and the crown slightly shortened and the patient told to prepare for the worst in the near future.

There are, probably, no teeth in the human mouth the loss of which is so severely felt as the inferior front teeth; and no others, as a rule, so exempt from caries; and, although they generally are the last to yield in the struggle to serve their possessor, yet, how frequently they are compelled to quit the field while yet healthy and complete in form and structural strength, but merely wanting in support!

And where can we point and say, "this is the way to meet the case and prolong the service of these valuable but disabled organs." We ask our brother dentist here and there: "What do you do where the inferior incisors become loose, elongate and greatly interfere with the function of mastication?" Answer: "I treat for a while paliatively, and soon have to remove them?

That salivary calculus, pyorrhea, undue elevation of position, etc., attending these cases may be surgically and therapeutically treated there is no doubt; but, that in the large majority of the cases presenting, which are likewise generally in subjects beyond the acme of life, these means fail to render anything that can be regarded as of permanent good, wherever a degree of looseness is already established is also true. Mechanical devices for support, placed about the neck of these loose teeth, binding them to their adjoining neighbors, has to some extent been practiced and been of some benefit; but the instability has been but partially checked, and the trouble allowed to go on.

It is obvious that so long as use produces undue pressure upon the alveolar border, absorption of the osseous supports will result. Hence, the remedy that offers the most good is that which will secure the greatest amount of quietude and steady support under all attending conditions. Any support placed about the tooth and at the time leaving the extremities free, will, when the masticatory force comes upon the end, act upon the principle of the lever and fulcrum, and must irritate and excite an increase of the wasting process and thus keep up the mischief. We then conclude this support must be furnished by the neighboring teeth under a mutual compact; and that to be efficient, it must be placed at the upper end of the crown. And as the position of the teeth forms an arc of a circle, this can be most effectually done, even though some are quite loose; and one or more may even have become entirely detached.

The plan I wish to present for your consideration has been most effectually tested, and while I think it an original one, some of you may have used the same means; yet, the common interest cannot be lessened whether it be new or not.

For illsutration we will paraphrase a case with features to all of us quite familiar. Say probable age from 45 to 75, with most of the inferior teeth remaining, but all show more or less wearing down. The alveoli are greatly reduced about the incisors, and the two centrals are quite loose and are elevated at least one line above the rest."

Proceedure:

1. Remove the deposits and get the teeth clean.

2. With a well waxed piece of linen twine tie the eight front teeth together. Thus, begin by one or two turns around the neck of the left first bicuspid and tie a knot. Next tie one lap over the left cuspid, bring both threads between it and the adjoining incisor and continue in the same way with one lap and a knot between each tooth, drawing the thread tightly upon each until the right bicuspid is reached, and then well knotting around the neck of this or some other appropriate tooth. Then return with the same process of tying back to the point of beginning. In many cases the tying can deviate from this, as the peculiarities may indicate. Other devices may take the place of this; and in some conditions no such support may be needed.

3. Cut the ends of the incisors to a level so as to relate in antagonism with the upper teeth.

4. With a small circular saw in engine, cut a slot or groove in the ends of the loose incisors extending latterly in one continuous line, making a fissure about one line deep, and opposite each extremity of this groove make retaining orifices in the cuspids; or, if they are loose, the orifices may be placed in the bicuspids. At this point of the operation an impression may be taken with wax or modeling composition and the patient released for a period.

5. Adjust a metal bar, or yoke (gold, silver or platinum), s

formed that it will lie snugly in the fissure, before made, and with the ends resting in the retaining orifices.

6. Proceed to firmly anchor the yoke-bar into the fissures of the teeth; and its ends into the holes in the cuspids. To do this gold, amalgam or cements may be used, each having qualities best suited to meet certain conditions and preferences, and hence also the provisions as undercuts, approaches, etc., should correspond to favor the plan of anchorage adopted. If gold is chosen then the bar should be gold. If amalgam, then gold or silver for the bar; and if oxy-phosphate of zinc, gold or platinun; and the approaches should be in harmony with the plan settled upon.

In this description I have been general. You will readily supply the points that might be mentioned in detail, such as are indispensably needed, as retaining surfaces, under cuts in the fissures; on the bar; on its ends, or in the end orifices; and also the modes of forming the yoke-bar, etc.

Now if such a case as this is well done, the relief to the patient is so marked that early expressions of gratitude come spontaneously, and the mutual enjoyment of satisfaction and confidence in both patient and operator is full and cordial.

But deviations, complicating the case often attend; such as:

1. Irregularity in position of the teeth; some being within or outside of the line of the arch.

2. The points of the crowns of the teeth may be thin and forbid fissuring.

3. One or more teeth may already be entirely detached; or so near it that its removal is necessary.

We will briefly consider these embarrassing conditions somewhat seriatum:

1. Slight irregularity in loose teeth may often be corrected by tying them in, or out, as required, and in case of angular position, but otherwise in line, the fissure may cross more or less diagonally. In cases where one tooth or more is in or out of line too far, the yoke-bar may pass upon the lingual side of the tooth's end, and, as the case may demand, the fissure be made across the cutting edge of the tooth instead of extending in a line with the edge, and a branch bar to occupy it may be soldered to the main bar at right angles.

2. Where the points are too thin and delicate to fissure in a line

with the cutting edge, the bar may be adjusted to the lingual surfaces, and the fissure of each made across the cutting edge, while a branch attached to the main bar drops snugly into each and is there anchored. Or, small holes, one through each tooth point, may be drilled to meet the bar, to which small pins can be soldered that will rest in these holes and there be secured.

3. Where a tooth is already detached, it must, previous to the tying of the row be secured in place at the root end, or as near thereto as is possible or proper. This may be done by making a hole or slot directly through the root of the fugitive tooth in a line with the arch; also upon each tooth contiguous to the vacant space, and at relative points to the hole; retaining orifices or slots are cut (but with due care where vital pulps are in danger). Thus, then, a suitably formed pin or bar is passed through the root of the fugitive tooth, so that its ends may enter the slots in the adjoining teeth, and be firmly anchored. Where a tooth is lost, a plain plate artificial tooth may be backed with lateral projections at the base to anchor into the roots of the neighboring teeth and a fissure formed at the cutting edge by grinding a portion of the upper back face of the tooth away for one wall and extending the backing well up over this ground surface for the other.

An almost indispensable implement in performing this kind of work is a nicely running small circular saw, for forming the fissures or slots, and also to aid in cutting off the ends of the elevated teeth, etc. They should vary in size from one-eighth to one-third of an inch in diameter. These are also useful for cutting out fissures in crown cavities, trimming edges, reducing stumps for crown work, cutting out old fillings, etc. They are probably not furnished in proper sizes by dealers at present. They are not, however, difficult to make from the handles of old separating files. Draw the temper by heating, then cool gradually. Drill a hole (which may be squared with the point of a small file) and cut as circular with snips and file as you can. Make a shaft out of iron wire to fit your engine (these iron wire shafts are useful in many ways), and dress the end to fit the hole in the disc, into which secure it by riveting. Now put it into the engine and true up by running it against a file or corundum slab. Next, place it in the vice and with a fine angle-edged file make the teeth. Or, with a properly formed cold-chisel cut the teeth, by even taps of a small hammer, shifting the wheel in the vice as required, and continue the cutting until completed. Then put into the engine once more, and true the teeth, etc., where needed; then temper by heating upon charcoal, and when quite red, drop into water. Several of different sizes can be soon made in this way, and may be resharpened by drawing the temper and again using the file, when the temper may be again restored as at first.

GIVE CREDIT TO WHOM CREDIT IS DUE!

BY FRANK A. BREWER, SAN FRANCISCO.

We observe in one of our Dental Journals that a "patent" has been granted to a member of our profession (an amateur we guess) for an improved process (as he claims) in the re-lining of rubber dental plates, through which method entire reconstruction of a base in cases of gum shrinkage, or misfitting, is obviated.

If we fully understand the specification as presented in his claims, we fail to perceive any variation from the same method followed by us as early as the year 1864, which process consisted of surface scarification, tunnelling and dovetailing of the base, both in sectional restoration and where entire lining was indicated; in the latter instance leaving only sufficient body of the base to sustain the teeth in position.

Owing to the simplicity of the method it was presumed at the time that the process was commonly practiced by others, hence the propriety of its publication was temporarily questioned.

But finding at a subsequent date that none appeared, a paper was finally prepared for the Missouri Dental Journal, but upon the eve of its mailing, a copy of that journal came to hand having in it an article from the pen of Dr. Morrison of St. Louis describing a like method, and as his article appeared prior to that of any other (as far as we were able to discover), upon his shoulders should fall the mantle of originality, no matter how many previously followed the same process.

We presume by addressing the former publisher of that journal a copy containing the article alluded to, may yet be had.

In connection with this subject the need of a condensed or abridged encyclopedia containing a record of all instruments and methods of practice and the same credited to the proper authority is evident; we cannot allow this occasion to slip by without adding the historical fact, that at the period mentioned and also subsequently, but few operators have been so selfish or ungenerous as to deny a mutual interchange with their professional compeers of the fruits of their genius, skill, and what was frequently the outcome of much varied brain labor. The idea of patenting was most contemptuosly spurned on their part, and the only recompense afforded or desired as a crumb of comfort, was that of a published description of their skillful emanations. The full realization of their nobleness of character thus became manifest!

But now the issue has entirely changed, and individual protection is an apparent necessity, as it is observed that the emanations of one's skill almost entirely disappears and subsequently reappears, but under a somewhat new guise and with the credit of originality unjustly transferred to a different individual.

When the misappropriation of proprietary originality of gold crown caps, celluloid disks, three-sided nerve canal reamers, circular faced or spoon excavators, twist nerve-canal drills, and many literary productions, is seriously considered, one cannot help harboring that animal trait "selfishness," though "Vice" it be.

The constant disappearance of our veteran members by death or withdrawal from our profession, many of whom are the first inventors of the numerous accessories, the fruits of which we are now enjoying, partly accounts for the error specifically named and for others so frequently realized by those who are fully able to see within the mirror of experience the abuses in their varied delineations.

RUBBER.

BY DR. F. W. SEABURY, PROVIDENCE, R. I.

After thirty year's experience the successful manipulation of rubber is a secret. Most of the information distributed in books, essays, and letters patent is either unimportant or misleading.

No definite process of any value for manufacturing dental rubber has ever been made public.

To the best of my knowledge, judging from the product, there is but one good receipt, in this country for making red dental rubber that used by Eugene Doherty.

I was told by Mr. McCormack, who was foreman for Doherty for fifteen years, that there was nothing used in his red rubbers but pure vermillion, sulphur and Para gum In black rubbers they use nigger-head rubber from Central America because it is the blackest.

When we buy dental rubber it is impossible for us to tell what pigments have been used to produce the color and whether they will be injurious in the mouth or not; so that our last and only resort is to be able to judge by the color, shrinkage and toughness after vulcanizing. To do this requires a vulcanizer which will produce an accurate and uniform result. With the water-bath vulcanizers now in use, pure clean rubbers cannot be distinguished from those made of the cheapest rubber, loaded with earth and pigments.

Most red rubbers now on the market, when vulcanized the usual way in a water-bath vulcanizer, have to be marked before they are vulcanized in order to distinguish them when taken out. So the first point is to use a process which will develop the color. Now it has been known for years that this could be accomplished by keeping the rubber absolutely dry, by sealing with tin foil, baking in a hot air chamber, or using superheated steam. After washing, rubber should be seasoned for about three weeks, before mixing, to prevent shrinkage. When water is used in packing and vulcanizing there will always be a space between the rubber and the teeth, and one cannot tell whether the water expands or the rubber shrinks.

In a water-bath vulcanizer as the pressure of steam increases the conducting power decreases, and heat tends to accumulate near the point of application. Rubber manufacturers, when vulcanizing, keep blowing off steam, thereby causing a circulation and equality of heat in all parts of their ovens; that is to say, the thermometer on a water-bath vulcanizer, even when accurate, does not indicate within twenty degrees the actual heat of the bottom-flask. (The foregoing is intended to show that a tough dense plate may happen to come out, but can never be depended on.) The thermometer may register by the conductivity of the metal without any reference to the amount of pressure; a steam gauge is necessary to correct this. Rubber softened when under high pressure is never porous. Rubber vulcanized in a hot air chamber without steam is always brittle; the color is good, but it requires from 4 to 5 hours to harden it.

Superheated steam applied instantly is the perfect medium for conducting heat to rubber, because it requires less time, gives the best color, preserves the elasticity of the rubber; being a rarified gas, the indicated is always the actual temperature for all parts of the oven, and the rubber need never be burnt, made granular, or porous. That is to say, in order to vulcanize rubber properly the steam generator must be separate from the oven. So that high pressure steam, say 110 pounds can come into the oven instantly, so as to produce pressure before the heat is communicated to the rubber. To avoid moisture from condensation the oven must be heated independently of the generator.

To harden dental rubber appears a simple matter enough, but to do it so that it may maintain its best qualities is more difficult than most persons suppose, and a large part of the rubber dentures manufactured are either oversteamed or insufficiently hardened.

REPORT OF CYSTIC ABSCESS IN A CHILD.

BY CHAS. C. HUNGERFORD, D D. S, KANSAS CITY.

About February 1st, I was called to see a child of six years, who had a tumor the size of a small hickory nut upon the external surface of the right inferior maxilla, and extending from the temporary lateral incisor to the second molar. The tumor was of about fifteen month's standing, slowly increasing in size. There was complete absence of pain, and the overlying membrane normal in appearance. The hard and resisting character of the growth, together with what appeared to be a slight lateral motion upon the surface of the bone, led to the conclusion that it was a simple fibrous growth. The temporary teeth above the tumor, being very loose, were removed, and an exploring probe passed readily into a large cyst, determined at once that the underlying structures which enveloped the germs of the permanent teeth had been destroyed. Turning the probe outwards its point could be distinctly felt against the bulging hypertrophed periosteum which formed the outer wall of the cavity. The alveoli having been completely absorbed, considerable carious bone was removed with as little injury as possible to the external wall, it being hoped that the periosteum would regain its normal condition and new bone be produced. The cavity has since been daily syringed with a weak solution of iodine and carbolic acid. The wall at the tumor is gradually resuming its natural position, and the pocket filling up. The probable cause of this tumor is due to the fact that aching and diseased temporary teeth were allowed to go on to abscess and ulceration, and the absorption and continued irritation produced death of the germs of the underlying permanent teeth, resulting in further destruction of tissue, and what will ultimately be malformation of the arch and absence of two or three of the permanent teeth. The object of this report is to call attention to the too frequent neglect of children's teeth, trusting that it will come right in the end; but resulting more often in irregularity and deformity.

BRIDGE WORK.

BY DR. D. F. M'GRAW, MANKATO, MINN.

Read before the Minnesota State Dental Society July, 1884.

Mr. President and Gentlemen of the Iowa State Dental Society.—There is probably no subject that has come before the dental profession in the last decade that has attracted as much attention as the subject of bridge work, or the no plate system.

Nearly twenty years ago, Dr. Roberts of New York published in the *People's Dental Journal* an article of which the following is an extract.

"We discovered that, of the red vulcanite, commonly used by dentists, no less than one-third consisted of the coloring matter, bisulphuret of mercury, or the vermillion of commerce, and that the balance was composed of sulphur and rubber, in nearly equal parts. Medical testimony informed us that the bisulphuret of mercury produces the same effect upon the system as pure mercury; we also found that in the process of mixing these ingredients none of their properties are lost; and by actual experiment, before and after vulcanizing, the weight of the substance is the same.

It therefore became evident to us that the bisulphuret of mercury and sulphur—two substances confessedly injurious to health—were actual ingredients of the material when placed in the mouth; and common sense, as well as science, taught us that such effects as were perceptible in such mouths could proceed from no other cause.

These effects, as noted in our own experience, and declared by the evidence of many others, were, first, a great absorption of the alveolar and bony substance of the jaw; next, irritation of the mucous membrane, and a condition nearly approaching salivation; then gastric irritation, and finally, the general derangement of the health consequent upon such abnormal conditions.

All these symptoms of disease were removed by simply removing their obvious cause, red vulcanite.

One cause of these inflammatory conditions under red, or any color of vulcanite, is the fact that it is a non-conductor of heat; and this cause, as will be apparent to any physiologist, is sufficient to produce the worst results."

And yet, gentlemen, with these facts staring us in the face, we go on extracting badly broken down teeth and roots, that we may insert this substance which causes great absorption of the alveoli, irritation of the mucous membrane—a condition nearly approaching salivation, and gastric irritation.

Is it not time to make a halt, and try some other method? All honor be to such men as Keocker, Hayden, the Parmlys, Brown, Harris, Taylor, Arthur, Allen, Dean, McQuillen, Goddard, Tucker, Webb, and scores of others whose names we could not enumerate.

They have fought a grand fight, and when they were called from their life work, it found them only beginning to see the fruits of their labors ripening.

How much more substantial is the life-work of these men, than that of the Crawcours and M. Taveau who were the orignators of the Royal Mineral Succedaneum, or of that which is now known as silver filling,—amalgam.

The first work that was ever done that in the slightest feature resembles the bridge-work of to-day, was performed by Dr. Marshall H. Webb in 1873. It was a case where he replaced a missing central incisor. The pulps in the central and lateral incisors, next to the space to be filled, were dead. The operation was performed as follows:

The cavities in the pulpless teeth were suitably formed and an impression taken. A plain porcelain tooth was next backed with gold, a portion of the backing extending about one and one half lines each side of the crown for insertion into the cavities. Gold wire was soldered to each end of the backing to fit into the pulp chambers of the central and lateral incisors. A small gold plate was formed to fit the gum. When the backing was riveted to the pins in the porcelain crown and this gum plate placed in position, the backing and plate were secured by wax so that they could be removed intact, and after being placed in a matrix, soldered.

The surface of wire was barbed with an engraver's bossing tool, so that the gold foil would better secure the crown. Light rubber dam was applied to the central and lateral incisors the crown placed in position and the upper points of the gold wire secured by cement and the rest of the pulp chamber and cavity filled with No. 4 gold foil.

Our method of putting in Bridge-work is as follows:

We use block tin for measuring the teeth adjacent to the space to be supplied. It is rolled out to 28 or 29 stubbs gauge. The tin is carefully bent around the tooth and pressed with flat pliers the length of the tooth, thereby giving a perfect form of the tooth. The tin is then taken off and cut by the mark left by the pliers, and is used as a pattern from which a gold band is made. These bands are then beveled, bent into shape and soldered. The bands are made from American coin gold rolled to 27 or 28 stubbs gauge and the solder lacks only one carat of being as fine as the band, thereby giving nearly the strength and exact the color of the gold used.

The bands are fitted by being slowly driven over the teeth with frequent annealings and cutting of points likely to come in contact with the gum until the edge of the band is the shape of the process. It is then removed and the edge nicely beveled with a fine file, replaced and driven up until the beveled edge extends up under the free margin of the gum. Then cut away the outer portion where it might show a narrow band, leaving the rest of the band full until adjusted. This ends this part, for the time being. An impression is now taken in the best yellow beeswax, also an articulation and your patient dismissed.

A model is made and articulated and the teeth ground up and waxed into position, great care being taken that only the points touch the gums. If it be a case of the six superior or inferior teeth the cutting edges are beveled from the palatine or lingual surface to the labial surface, in order that the platinum backings may lap clear to the labial edge, and thus bear the force of mastication instead of the porcelain.

The teeth are then removed from the model and placed in chloroform to remove every particle of wax. They are then carefully backed with platinum and invested in plaster and fine river sand. After the investment becomes hard, the platinum backings are coated with borax and placed over a gas heater to dry out. After thoroughly drying, a backing composed of 80 per cent. of coin gold and 20 per cent. of platinum is flowed over the platinum backing. This gives an exceedingly hard masticating surface that is not worn by attrition. The teeth are allowed to cool and are then filed up and laid aside to await the next step in the process.

The bands are now again placed in position and an impression taken in plaster. The impression is removed and the bands are removed from the teeth and accurately fitted into their position in the impression, which is then varnished and a model made upon which will be found the bands on separating. The teeth are then waxed into position, and as much of the model cut away as can be spared without weakening it. The model and teeth are then invested in plaster and sand, leaving the palatine surfaces of the teeth and bands exposed. After the investment has hardened, the wax is removed and the backing of the teeth and bands coated with borax.

The spaces between the teeth and bands, and the teeth themselves, are filled in with platinum scraps and gold foil, which in turn is coated with borax.

The investment is then placed in the heater and allowed to dry, and then soldered, using the same kind of solder that was used on the bands.

The bridge is now ready for finishing. It is then placed in the mouth, and any mal-articulation corrected. It is then removed and the teeth which are to receive the bands and the gums are dried. The gums are painted with tincture of gum benzoine to keep out all moisture. The assistant has in the meantime mixed some of Moffit's cement, which is the best for this work, and coated the inside of the bands and the teeth which are to receive the bands with the cement, when the bridge is gently driven into position. After it is in place, if the bands do not touch the teeth at all points drive up the edges with smooth foot plugger before the cement has hardened.

Remove all superfluous cement, bevel the remaining edges of the bands and polish, and your work is finished.

For the back teeth the same plan is pursued, except the substitution of cuspids for bicuspids and wide central incisors for molars. These are backed with platinum, and a gold masticating surface is struck up in a Knapp die, the porcelain serving only as a face, which is protected by the gold masticating crown which overlaps it.

Where bands are attached to the bicuspids or molars, the gold is allowed to lap between the cusps of these teeth to prevent the bridge from crowding down onto the gums in eating.

This, gentlemen, is bridge work.

A CASE OF IRREGULARITY.

BY J. E. MILLER. D. D. S., ST. PETER.

Read before the Minnesota State Dental Society, July, 1884.

MR. PRESIDENT, I invite your attention to a case of irregularity that presented itself to me a little over a year ago, with a history nearly as follows:

A youth, age fourteen, robust and one of a family of five children, three of them showing the same irregularity in a marked degree, and one being entirely exempt.

The case is one of hereditary irregularity, presenting the following characteristics:

The superior incisors and canines protrude so far, that when the jaws are closed there is between them and the lower teeth a space of nearly half an inch, owing in part to a sightly contracted lower arch. The internal cusps of the upper bicuspids,strike on the outer cusps of the lower teeth. There is also a considerable space between all the incisors, both upper and lower.

I shall briefly state what in my opinion are essential points to be taken into consideration before attempting to correct an irregularity of any kind.

Irregularities may be divided into two classes. Hereditary and acquired. Of the former we know little or nothing. We can only say what we do of the ryhthmical contraction of the heart, that it is an inherent endowment.

Acquired irregularity, on the other hand, is of a more tangible kind; we can trace it to different and definite causes, such as accident, attrition, unnecessary or premature extraction, thumb-sucking and many other causes.

Three things should be taken into consideration: soundness, durability and appearance—soundness of the teeth, durability of the operation, and appearance before and after treatment.

There are also three principles involved in mechanical treatment: The inclined plane, traction and the screw.

Of the different appliances in use I am decidedly in favor of those that give an intermittent force, for the reason that parts that are subjected to continual pressure and irritation should have intervals of rest. We must have a certain amount of passive inflammation to induce absorption, but we do not want an active inflammation. It would not only give rise to unnecessary pain, but it would create pathological conditions that must be overcome before we can attain our object.

Time should not be taken into consideration. It is wrong to see in how short a time a tooth can be moved from an old into a new position. It ought not to be done faster than absorption takes place on the one hand and deposition on the other.

To know how fast this is we have only to call to mind the erupting process of a tooth, where we find absorption is cotemporaneous with the advance of the tooth.

We have every reason to believe that absorption will take place as rapidly under artificial stimulation, as it does naturally.

If you move a tooth slowly you will be able to dispense with the retaining band as soon as though you had removed the tooth the entire distance in a day; and you do it safely. The treatment of the case in hand was as follows:

An impression was taken and a plate made with extensions around the maxillary tuberosities and forward to the buccal side of the first molars, being careful to avoid pressure on the soft parts. Tubes with threads cut into them for the reception of screws were vulcanized into the extremities of these extensions.

A metal band was constructed to pass around the arch in front, the ends being provided with screws, entering the above mentioned tubes.

This appliance though successful in a former case, treated by Dr. Gorgas, of Baltimore, failed in this case, owing to inability to prevent unbearable pressure of the plate on the roof of the mouth.

Another appliance was then made, consisting of bands surrounding the first and second molars of each side; these bands being soldered together, and so united that only one thickness of metal came between the teeth. The anchorage for each side now embraced two molar teeth, to which were attached on the buccal surface of each side, a screw nut fitted to receive the pull back screws with which the long band passing around the front teeth was provided. It is quite necessary to band two teeth on each side to get sufficient support, and to prevent the bands from slipping on the teeth, which would make it rather difficult to turn the screws.

This apparatus moved the incisors and canines very easily. As mentioned, the bicuspids were also everted. These were regulated with a retaining band in the following manner:

A plate was made having a standard vulcanized into it at the centre. A wire cable was then made by twisting together four strands of fine nickel plated wire. I think this preferable to a gold band in that it is not so conspicuous in the mouth. easier to adapt, and cheaper in case of breakage. This cable was passed around the front teeth, back to, and through the spaces between the bicuspids and attached to a standard vulcanized into the centre of the plate. The bicuspids were brought in by simply shortening this cable as required. In three months the teeth were brought back to the position shown in the model. At the end of another six months the retaining fixture was taken out, the teeth to all appearance being firmly fixed in their new position, and the expression of the patient wonderfully improved.

The retaining fixture should be worn at intervals, until such time, as it is safe to withdraw it entirely.

SELECTIONS.

DECIDUOUS TEETH.

BY DR. A. G. FREDERICHS.

Read before the Lousiana State Medical Society, May 1884.

The different changes which the jaw undergoes during the development, eruption and loss of the teeth have long engaged the attention of anatomists.

Many theories have been advanced but no single one of them, so far, has afforded a complete explanation of the various attending phenomena. To present this subject in a more lucid way, I will deal principally with the development of the lower jaw; as its isolated position is complicated with fewer bones and as the principles involved apply likewise to the development of the upper jaw.

The different parts of the lower jaw answer for different purposes: one division of its body having a close and intimate relation with the teeth. The alveolar portion of the jaw, that which lies above the level of the inferior dental canal is developed around the teeth; when they are lost it disappears, to be reformed again for the second set of teeth, and is finally wholly removed after the loss of the teeth in old age. The portion of the jaw below this line, which is essential to deglutition and respiration, is late in acquiring any considerable development; once formed it is never removed, save when the muscles of mastication are no longer in full use; in advanced age it becomes to a slight extent only wasted. I will not tire you with an elaborate description of the various stages in the growth and ossification of the jaws; suffice it to say that nature is very profuse; a large amount of bone is formed which is subsequently absorbed. It is a modeling process in which thick, shapeless masses are dabbed on to be trimmed and pared down into form. The lower enlarging externally and elongating backwards of the cornua and the upper extending anteriorly and latterly until the inherited size is reached. Dr. Weale says, there is also interstitial growth which takes place; be that as it may, the question is far from being settled.

The mechanism by which teeth at the date of eruption are pushed upwards into place is far from being perfectly understood. The simplest theory would appear to be that they rise up in consequence of the addition of dentine to their base; in fact, that their eruption is due to the elongation of their roots. Very strong objections have been brought forward, clearly proving that this cause is quite inadequate. In the first place, teeth with stunted roots, which may be said to have no root, are often erupted. Again a tooth may have the whole length of its roots completed, and yet remain buried in the alveolar ridge through half a person's life, and then late in life be erupted. Morever, when a healthy normal tooth is erupted, the distance traveled by its crown materially exceeds the amount of addition to the length of its roots which was going on during the same time. Addition to the margins of the alveoli keep pace with the gradual elongation of the roots and as this is a moderately rapid process the aveolar portion of the jaw increases in depth almost abruptly. The eruption of the teeth is not a continuous process, but is interrupted by periods of repose, and individual variations are numerous.

The following may be an approximation of the truth. The two lower centrals are erupted within the first nine months; their eruption takes place rapidly and is completed in about twelve days; then follows a period of repose for one or two months; then follow the four upper incisors; then another period of repose for several months. The next to follow are the lower laterals and the four first molars; then a rest of four or five months. Then the canines, they being the only teeth of the temporary set which come down between teeth already in place, and they are the last of the temporary set to be erupted.

The dates of the eruption of the deciduous teeth vary, and no two authors agree upon any stated time; but the whole of the milk teeth are generally out by the completion of the second year. At the time when the crowns of the deciduous teeth are erupted the roots are still incomplete, and wide open at their base, and it is not until the sixth or seventh year that the temporary set can be called absolutely complete. At the sixth year the temporary teeth may be observed to be slightly separated from each other, and they occupy a more anterior position. The permanent incisors are behind the deciduous incisors with a slight overlapping of the central and lateral. The biscuspids lie in bony cells, which are embraced pretty closely by the roots of the temporary molars, the canines lie far above and altogether out of line of the other teeth. The first of the permanent set to make their appearance are the first molars.

Their bony crypts become widely opened by absorption, the crown passes out and new bone is rapidly formed which embraces the neck prior to any considerable length of root being formed; then follows the absorption of the roots of the temporary set. The root at or near its end becomes excavated by shallow cup-shaped depressions, these deepen, coalesce, and thus, gradually, the whole is eaten away. Absorption usually commences on that side of the root which is nearest to the successional tooth; it by no means invariably does so; it may be and is attacked on the opposite side, and in many places at once. The absorption of the temporary teeth is absolutely independent of pressure. When absorption and shedding of the first teeth have taken place early, before their successors are ready to appear, perfect little sockets are formed behind the last temporary teeth, cutting them off from the permanent teeth, which is another reason for regarding the process as not necessarily dependent on the approach of a displacing tooth. Closely applied to the excavation produced by absorption is a mass of a vascular soft tissue, the so-called absorbent organ. The surface of this is composed of very large, peculiar looking cells bearing some little resemblance to those known as myeloid cells, or the giant cells of recent authors. Microscopic examination of the excavated surface shows it to be covered with small hemispherical indentations, the lacunæ of Howship, into each of which one of the giant cells fitted and in which they may sometimes be seen in situ. In what manner the giant cells or osteoclasts effect their work is not known, but their presence where absorption of hard tissues is going on, is universal. Some suppose that they put forth amœbiform processes, others that they secrete an acid fluid, but nothing definite is known. The process of absorption once commenced does not necessarily proceed without intermission, but may give place for a time to actual deposition of osseous tissue on the very surface eroded. The eruption of the permanent teeth is a process closely analogous to that of the temporary set. Rapid absorption of the bone, especially on the exterior surface of the crypts, takes place and an orifice very much larger than the crown of the tooth is quickly opened out. Hence it is, that the slightest force will suffice to determine the direction assumed by the rising crown; a fragment of a root of a temporary tooth, the action of the lips and tongue, are all potent energies in modifying the arrangement of the teeth. I may now refer to the phenomena observed in the alveolar processes. They were first built up as crypts, with overhanging edges inclosing the temporary teeth; then they were swept away, in great part, to allow of the eruption of the temporary teeth, and next they were formed about the necks, to form the sockets of the deciduous teeth. Once more at the fall of the deciduous teeth, the alveoli are swept away, the crypts of the permanent teeth are widely opened, and the permanent teeth come down through the gaping orifices. When they have done so, the bone is reformed so as to closely embrace their necks, and this at a period when but little of the root has been completed. Take, for example, the first upper and lower molars: their short and widely open roots occupy the whole depth of the sockets, and reach respectively to the floor of the antrum and the inferior dental canal. No growth can possibly take place in these directions; the utmost available depth has already been reached, and as the roots lengthen the sockets must be deepened by additions to their free border. It is impossible to insist too strongly upon this fact, that the sockets grow up with and are moulded around the teeth as the latter elongate. Teeth do not come down and take possession of sockets more or less ready-made and pre-existent; but the socket is subservient to the position of the tooth, and wherever the tooth may chance to get, there its socket will build up around it. The position of the teeth determines that of the sockets, and the form of the pre-existing alveolar bone has little to do with the disposition of the teeth. The formation of the jaw bones and alveolar processes are entirely independent operations of nature. There is a period in the history of the jaw when it is as much a jaw bone as at any subsequent time and before a tooth has made its appearance. If through any freak of nature no tooth should ever develop, the jaw will in no respect be aborted in growth. It will continue to thicken and elongate in the case of the lower one, and widen and enlarge in the case of the upper, until it has reached the full measure of its inherited type, and neither absence of teeth congenitally, nor their removal after development will interfere with this function. But, as I have already stated of the alveoli as a process of the jaw, we find an entirely different condition. Alveoli are the result of the development of the teeth and coincident with their growth. The alveolar processes, to a certain extent are constantly changing. It is quite doubtful if a single bony particle of the alveoli of adult life formed a part of the alveoli of childhood.

In a purely physiological condition, it is forming and absorbing—forming again, and again absorbing—and again a third time forming, only to be absorbed again when the final issue arrives of the loss of the teeth. In a pathological condition this process of formation and absorption may go on repeatedly.

The mistaken idea of a shrinkage of the jaw must certainly be based upon changes which are apparent in the alveolar process, but which do not involve the jaw. The growth or enlargement of that part of the jaw upon which the deciduous dental arch is situated seems to have obtained its complete development at the period of shedding, and the incisors and biscuspids will find room equal to their necessities. The premature extraction of the centrals, laterals, biscuspids and molars, or any one of them will not interfere with the natural and expected enlargement of the jaw, but the premature extraction of the canine teeth will be likely to lead to some serious results.

After the jawbone has ceased its enlargement, there seems to be an almost universal tendency for the biscupids and molars to crowd to the anterior part of the mouth, and to fill any space in the alveolar arch that may not already be occupied. This is not only true in the formative period, but is equally true in adult life if the occlusion of the opposing jaw does not counteract it. The consequence of this inevitable tendency is, that unless the temporary canines remain in their places until their permanent successors are ready to emerge, the bicuspids and whatever molars are behind them will crowd forward and occupy the same space which belongs to the canines. We thus see whatever may be the inducement to remove any or all of the deciduous teeth prior to their period of shedding, the canines should be retained until there is ample evidence of the early emergence of their permanent successors, unless the health and comfort of the child would be jeapordized by their retention. It would certainly be far better to remove any or all of the deciduous teeth and take the risks of irregularity in the permanent ones, that to submit the child to constant suffering and consequent injury to its health by their non-removal.

To say retarded dentition is due to the retention of the temporary set, and to advise the removal of any of the temporary teeth regardless of any evidence than the permanent ones are ready to erupt, I consider absurd and without foundation in fact, and yet such a thing has been advised.

The adoption of such a method will unquestionably lead, in a great many cases, to very serious results. The issue involved is the function of absorption, and such a practice would indicate that the non-absorption of the temporary tooth was the cause of the retarded dentition, rather than that retarded dentition was the cause of non-absorption. As long as the temporary teeth remain firm and undecayed and give no evidence of misdirecting their permanent successors, I say it, and say it emphatically; let them alone.

There seems to be a very prevalent idea that the deciduous teeth are of no value, and in consequence thereof, deserve no attention, satisfied with the narrow minded view that, should they be lost, and will be replaced by the permanent set. Deplorable it is that such an idea should have engrafted itself upon humanity! The teeth are certainly intended to perform important offices, and every effort should be used to retain them in the mouth in a healthy condition until their successors are ready to be erupted. They are valuable in the mastication of food, and under favorable conditions they ought not to decay at all, and should drop out, as white and clean as when they were first erupted. When a temporary tooth decays the pulp dies and inflammation is set up which interferes with the absorptive process, and the root remains a mechanical obstacle to the advancing tooth and in consequence will be erupted either inside or outside the line of arch, causing an untold amount of suffering and finally resulting in an irregular and crowded denture, which completely mars the comeliness of the face. The neglect of these teeth and the consequent suffering and injury to little children is a reproach to all those who fail to see or who disregard their obligations in this particular. It is the duty of every humane man to do all in his power to induce parents to understand the importance of giving such attention to the deciduous teeth as will prevent the occurrences to which I have just referred.

It is to the family physician the welfare of the little ones is intrusted, and the specialist is rarely consulted; it is under his observation that the first evidences of disease and decay may occur. His duty requires, his conscience demands his best efforts to check the impending evil. He is, as it were, a self-constituted sentinel to warn and avert any and all dangers which may threaten the sanitary welfare of humanity. Let him rise to that "Higher Life' which exacts the exercise of his abilities for the prevention rather than the cure of disease. Let him also co-operate with the specialist in every thing that contributes to the well-being and improvement of the human race, and the yet unborn will attest the wisdom of such action.—*Trans. Louisiana State Medical Society.*

DENTAL SOCIETIES.

MISSOURI STATE DENTAL ASSOCIATION.

TWENTIETH ANNUAL MEETING AT SWEET SPRINGS, COMMENCING TUESDAY, JULY 8, 1884.

Reported expressly for the ARCHIVES OF DENTISTRY.

CONTINUED FROM PAGE 299.

PRESIDENT'S ADDRESS.

Fellow dentists, I extend to you a word of welcome to this, the twentieth annual gathering of members of our profession, in our grand old State.

These meetings are indications of progress; from them we go forth stronger in our line of duty. Our attendance here is no idle waste; no mere social gathering. In the light of past experience, I can truly say that each one I have attended has proven very profitable. Writers have asserted that denistry as a science was practiced among the ancient Egyptians, and to substantiate the affirmation, declare that the teeth of Egyptian mummies are found filled with gold. Strange to what unwarranted extremes searches after the "Lost Arts" will go. We have the highest authority for saying that the declaration is wholly without foundation; that it is a dream of some literary visionary thrust upon the attention of a credulous world. No proof can be brought to prove dentistry as being one of the "Lost Arts." The bible does speak of an eye for an eye and a tooth for a tooth, and I presume they had some crude way of extracting the tooth when necessary to fulfill the requirements of the Mosaic law, for it was very strict. "It never let any guilty man escape." Perhaps to *knock* out the tooth, was the extent of dental knowledge. About the year 1600, when the world was awaking from the lethargic slumbers which had characterized it for centuries, there were a few books published relative to the teeth; and about 1700 the French dentists were required to undergo a special examination before practicing their profession. That their ideas of dental work were very crude is evidenced by their lack of progress. Fanchard, Bourdet and Sourdan were the leading lights of that time, and they, with others, did much to give dentistry a standing. Hunter wrote his great work about one hundred years ago. About this time Aikin made great improvements in dental instruments. Robert Woolfdale was the first dentist of any note in America. He located in New York, but soon returned to England. He was the first man of whom we have any record of having set pivot teeth. He is also credited with being the first to use gold foil for filling teeth in America. It is claimed, and is quite likely correct, that the first dentists who came to American shores, were members of the French and English armies in revolutionary times. The first native born American dentist of any note was Isaac Greenwood, Jr. He was Washington's dentist, and is said to have made several sets of teeth for the father of his country. The Greenwood family produced several dentists. From this small beginning a hundred years ago our profession has kept pace with the march of progress until now America leads the world in this, as it does in many other things. Other countries are looking to us for improvements, and at a rapid rate are we advancing. "The efficiency of thy merit is not sufficient," therefore try to merit more. Don't pride yourself on "knowing it all." We can all learn at the meetings of any dental society. Pride is increased by ignorance. Those assume the most, generally, who know the least. No dentist who intends to keep up with the times can afford to absent himself from his State association. Will we improve as much in the next decade as we have in the past? Look forward and make your standard high. The dental society is certainly an American institution. Our first National Societywas organized in 1840 about sixteen years before any other country had a similar institution, and it brought together, as all such societies do, the very best men in the profession, representative men, as it does to-day. This, the Missouri Society, held its first annual meeting in St. Louis in October, 1865. About twenty years ago this society was organized by about thirty of the leading men of the State, men who felt a deep interest in the welfare of the profession, and desired through these meetings to promote dental progress and endeavor to raise the standard of the profession. These meetings have been well and profitably attended and have greatly assisted in raising the standard of dentistry.

The time is now upon us when we need and must have educated men in our profession. Dentists are too prone to take any boy as a student, the only requirement being sufficient ready cash to pay his way. This is wrong, and a wrong that ought to be and must be righted. Let no dentist take a youth who is not well educated and who has in him, as he believes, the elements of success. I know several towns where dentists—so called—are turned out with such rapidity as to suggest the employment of steam as a propelling agent. They are ground out as it were, to prey upon a too credulous public. Now this is more the fault of the dentist than of any one else. Of course say you, the laws of our State, as well as those of other commonwealths, prevent this thrusting of uninformed dentists upon the country. I answer, the laws are not enforced and I would suggest the apointment of a committee by this association to consider ways and means for the enforcement of existing laws and the recommendation of additional safeguards. Numbers of unregistered dentists are plying their vocation, and dentists of standing say they dislike to interfere with them, individually. I deem this a matter of much importance, and as we have the law it certainly ought to be enforced. In 1840 the Legislature of Alabama passed a law regulating the practice of dentistry and medicine for the purpose of guarding the unsuspecting and too credulous public against the charlatan and quack, since which time, some eighteen other states have passed similar laws: namely, Georgia, Illinois, Indiana, Iowa, Kentucky, Lousiana, Michigan, Mississippi, North and South Carolina, Ohio, Pennsylvania, Vermont, and West Virginia, all of which have examining boards. Missouri requires a diploma from some reputable dental College; New Hampshire, Board of Censors; New York, certificate of State Society; and it is not denied by any that the action thus taken by these law makers has proven a great blessing to the people. Our law still needs revision, especially in regard to allowing any and every one to extract teeth. We have had a fair example of the workings of this provision in Kansas City. Teeth are broken by the score, and many victims are on the hunt for some one who can extract a tooth. Now the Kansas City dentists are aware of this fellow's way of doing business. Hundreds of people flock to his tent nightly to be humbugged by this quack, this brilliant gentleman with his long chain, so-called medals, diamonds and cheek; these are his principal stock in trade.

I have formerly been in favor of taking into our society any repentant who would show any disposition to improve, but I find a great many join societies for the sole purpose of telling their patients of it and of advertising the fact, and who do not want to be elevated or educated. I would suggest that hereafter, our examinations be very strict; and that we issue certificates of membership annually to every member in good standing, and that the names of all such members be published in at least two of the leading papers in the State, or in pamphlet form, and all members who neglect or fail to pay their dues annually be dropped from the roll of membership. The people are finding out that the State Society amounts to something, and I am often asked if Doctor so and so belongs to it. Now, I believe it to be the duty of this society to let the people know who the members are. We owe this to the public.

In conclusion, permit me to thank you for the high honor conferred upon me in selecting me as your presiding officer; my wish is that this society may do even greater good in the future than it has in the past. When we go forth from this hall let us go full of hope and energy, and return next year with a fund of valuable experience, which each and all will contribute to the general fund of knowledge.

FILLING TEETH.

BY C. B. HEWITT, KANSAS CITY.

If I can say anything on this subject to help the beginner or provoke discussion I shall have done all I intended in this short paper. The first thought that impresses me is the total disregard some operators have for the beauty of a natural tooth.

The gold that glitters has such a fascination for some men that they think nature can be very much improved by a liberal display of the beautiful in art.

Our eyes are often pained to see many teeth that had been things of beauty but for the interference of the dentist. In many cases when the teeth are badly broken, it is impossible to conceal all the gold, and then the patient will have to pay the penalty of neglect and submit to the unsightly appearance of filled teeth. But when the teeth are taken in time it is much easier, more artistic, and results in making a more substantial piece of work to fill almost all front teeth from the lingual surface.

My reasons are, first, we can use the mirror, and in operating retain a position that is not tiresome to the body. The perfect use of the mouth mirror is one of the great accomplishments of a thorough dentist. Without it we are often compelled to grope in the dark.

Secondly, we can get better anchorage. The reasons are quite apparent when we take into consideration the shape and structure of the incisor teeth. The enamel on the labial surface is much more perfect than on the lingual, so it will be possible to get a better margin and a firmer wall to build against. The convexity of the labial surface gives the concave form to the side from which we fill. We thus avoid the difficulty of filling an undercut which is a prolific cause of failure. In this case the undercut becomes the bottom of the cavity, and we fill directly into it. We also can see more perfectly to remove all disorganizing or decomposing dentine and thus guard against future discoloration and decay.

Use always unannealed gold to line the cavity.

With these suggestions on the filling of front teeth allow me to offer some thoughts on approximal fillings in bicuspids and molars. I do not think it possible to prepare a cavity of this description well without the use of rubber dam,as it is by the aid of this valuable adjunct we can secure that perfect dryness essential to discovering the difference between normal tooth structure and that which is beginning to decay. Such an approximal cavity may appear very small, but the softening may extend and almost always does extend nearly across the tooth. This you will detect by the white appearance of the enamel, and in the preparation of the margin at that point, you will find a spoon shaped instrument will easily scrape away the decaying enamel.

Every stroke of the excavator complicates matters more and more. The little simple cavity has grown to a large size and is assuming the form of a compound one. But do not falter and allow yourself to stop short of perfection. Just here is where many of our failures are made. We fail to follow up the enemy until the very last trace has been removed, and perfect enamel has been reached. The manner in which the work is done, is of more importance than the material.

In almost all these cases we are compelled to act through the crown surface in order to get perfect control of the work. Fissures in the crowns of these teeth are almost always involved and if they are not, we should not leave the margin of a filling ending at a fissure, even if you cannot detect caries. The margin at the bottom of a fissure, be it ever so sound, can not be well finished, better go a little further and leave no pocket to invite decay. After shaping the cavity and seeing that the cervical margin is perfectly smooth, and strong enough to resist the force of filling, cut a slight groove at the bottom of this wall. It need not be deep, but do not substitute retaining points. I have repented of that folly.

After polishing the margins as smoothly as practicable and slightly beveling the edges, the cavity is ready for the introduction of a filling. Take a cylinder of unannealed gold foil as large as can be conveniently introduced and press it lightly against the cervical wall; then lay a companion by its side, not using much force; then crowd the third one between these two, so as to force them out against the buccal and lingual walls. The walls being now protected, condense by hand pressure to avoid injury to the margins. Add three more cylinders and condense with the mallet, keeping the margins of the plug a little in advance of the centre. Proceed in like manner until almost to the grinding surface when change to annealed gold and depend mainly on its cohesive property. The next important thing is finishing the plug. Never stop until the filling is perfectly smooth; at the cervical portion, so that while passing an exploring instrument over it you cannot detect the change from tooth to filling.

Do not allow a patient to leave the office with an unfinished filling. The shape and size of the filling are all in mind at that time and it can be done better now than ever afterwards.

In conclusion, let me ask when did any one of you extract a tooth containing an approximal filling, and find the cervical margin finished as it should be?

Dr. Bowman, St. Louis, was invited to open the discussion on operative dentistry. He said three-fourths of our time is devoted to filling teeth, and hence this is regarded as the most important branch of our practice. The essayist has given his method, others have other methods but we all operate largely in the same way. We are all endeavoring to attain the same end, viz: the preservation of the teeth: any method that produces this result is a good one. I have my way. I separate the teeth chiefly by the use of waxed tape, and I continue to separate until I can see every part of the cavity to be operated upon. In the preparation of a cavity in a front tooth the lingual wall being weakest, is freely cut away. I cut away *all* weak walls, for the reason that I regard strong walls, necessary to a successful operation. We must have a strong abutment to build against. Many fillings that are well and cohesively put in, fail for the want of this precaution. Good judgment must be exercised in designing the plan for filling any cavity, whatever may be the material used. Soft gold against the walls is always advisable, on account of its ready adaptation. I don't think it necessary that non-cohesive gold should be used but gold that has not been recently annealed.

Dr. Conrad.—Anything that will improve our methods is of value. I don't wedge extensively. Never leave wedges in more than one day, lest it might be followed by unpleasant results. I use a piece of rubber dam for this purpose, and hand the patient a piece and show him how to use it. If more thicknesses are frequently added, space enough is usually obtained within 24 hours. In the treatment of fissures I always cut out such as are decayed, but do not open those that are not decayed. It is important that our patients are instructed to take good care of our work after we have done it. Many dentists think they are too busy to take time for this. In certain cases I regard retaining points as indispensable to success.

Dr. Patterson.—The matter of cuttting out fissures depends entirely on the character of the teeth under treatment. In teeth of poor structure all fissures should be opened, but in strong hard teeth it is not required.

Dr. Patterson then read a paper giving his experience with the Herbst method of condensing gold.

Dr. Thompson.—In regard to the conductibility of the old style soft gold fillings, we know a malleted filling is not tolerated so near the pulp as is the old style. The conductivity of these fillings is less than those of cohesive gold. I think the Herbst method more liable to leave air spaces in the filling, than when the cohesive method is followed, and for this reason the conductivity would be less. Soft gold and hand pressure are now being extensively used for a part of the filling, finishing however with cohesive. A cavity should be so prepared that all parts of it are readily accessible. As a rule the line of least resistance should be towards the vulnerable point.

Dr. Spalding spoke of the ease with which smooth layers of gold would cohere. He said no great amount of force was required, provided the layers were smooth and the surfaces of the gold clean. A very light blow, a single blow of the mallet, was quite sufficient under such conditions, to unite a number of layers of gold foil.

Dr. Stark thought the mallet would not be discarded but that its use would be modified.

Dr. Patterson is experimenting with the Herbst method and thinks the facility with which gold can be added to a burnished surface is suprising. With a hand burnisher it could not be done. Adaptation to the walls of the cavity can also be very readily secured by this method. Thinks the process a promising one.

Dr. Staples, Texas, favors the use of a 10 ounce leaden mallet, not so much however for the purpose of getting a heavy blow, as far giving a blow of equal force with a comparatively short traverse. A half inch traverse of a 10 ounce mallet will equal in effect a six inch traverse of a mallet weighing only two ounces. Uses cohesive gold exclusively. Thinks more depends on the operator than upon any particular make of gold foil. Has no favorite make. Men or boys do not mallet well, only girls or women ever become expert in the use of this implement.

Dr. Shepard has laid aside the hand mallet for lack of an assistant to use it, and has satisfactorily substituted a Snow & Lewis automatic mallet.

Dr. McMillen uses the mallet in all cases, with non-cohesive or unnealed gold, equally with that which is cohesive.

Dr. Hewitt uses the mallett less than formerly, for the reason that he now uses unannealed gold chiefly.

Dr. LaVeine has seen fillings put in on the Herbst method by Dr. Patterson and was pleased with their appearance.

Dr. Hassell, Lexington, has never discontinued the use of non-cohesive gold, believing there is nothing better for general use. Thinks too much malleting is detrimental. When gold is thoroughly condensed,let it alone,but it is not always easy to determine when this point is reached.

CAST TOP OF TOOTH-CROWN.

Dr. D. J. McMillen, Kansas City, exhibited a molded or cast top of a gold tooth-crown. The process of casting is thus described. Take a piece of sound charcoal,cut out a small square into which run a somewhat watery mixture of about equal parts of plaster and pulverized pumice stone. Select a tooth of the desired shape and size,and set it in the plaster mixture, sinking it as deeply as will equal the desired thickness of the cap when cast. Let the tooth remain until the plaster is well hardened, when on removing it the impress will be distinct and smooth. Dry the plaster thoroughly, melt the gold on the surface of the coal, tip the piece of coal slightly, when the molten gold will run into the mold. While still melted place the face of a hammer or other smooth body on the molten mass and a crown-cap is formed thick enough to stand the wear of mastication, or to admit of considerable dressing if necessary to perfect the articulation. The band is formed in the usual way, when the cap may be placed inside the band and allowed to telescope to suit the articulation.

If a long crown is called for, the cap may be set upon the band and soldered fast in this position. This cap is thick enough to admit of grinding to correct any defects in articulation, after the crown has been set. These caps can be very quickly made of any desired fineness of gold, and will be found very durable.

[TO BE CONTINUED.]

JOURNALISTIC.

"Reading maketh a full man; conference, a ready man; and writing, an exact man."

THE PROMOTION OF OSSEOUS DEVELOPMENT.—By George Watt, M. D., D. D. S. Read before the Mad River Valley Society. Published in the August number of the Ohio State Journal. "In the statement of the proposition it is taken for granted that bone may be developed, and that such development may be encouraged or promoted. In a constitution perfectly healthy and well balanced, the bony tissues are developed exactly to the extent that they are needed; but in this proposition it seems to be taken for granted, also, that the process of development is not always well balanced. It may be easy for one constitution to develop bone while it partially fails in the development of muscular tissues. In another, the constitutional tendency may be toward the development of nervous tissues, while another runs to fibrous tissue in general. The question now comes up—can we, in cases of badly balanced development, do anything to restore or to establish a constitutional equilibrium? All will admit that by violation of the laws of health we can do much to bring about an unbalanced state of the constitution; and it seems but reasonable that we ought to be able to do good by a reversal of the process." The phosphate of lime may be prepared by dissolving bones in hydrochloric acid, precipitating with ammonia, and washing and drying the precipitate. "We do not think any better form of the medicine has been suggested, but some has been prepared so as to be more pleasant and palatable. But food is better than medicine. Let foods rich in the phosphates be used. The lean meat of beef, mutton, fowls, etc., answer a good purpose. Cracked wheat, oatmeal grits, if properly prepared, are also valuable." * * * "To sum up, let us bear in mind that all tissues are built up from materials taken from the blood; that the nutritive functions create nothing, but only digest, assimilate and appropriate; that, therefore, unless the needed materials are in the blood, in the required quantities, there must be defective tissue building, or no development of tissues at all; that when the needed materials are abundant, there must be, other things being equal, a better and fuller development than when they are deficient in quantity."

A CURIOUS PHILOLOGICAL FACT.—A paper read before the California Wine Growers' Association recently contained the following philological theory: "The old Roman wine grower found in his tubs and vats the same sediment that bothers us to-day. He had no chemistry in those times, but he did have a healthy profanity. So he called his substance 'a hell of a stuff,' and probably so regarded it. Hell, in Latin, is tartarus,and from this ancient cuss word came in direct descent tartar, cream of tartar and tartaric acid."

WHAT IS THE BEST STANDARD FOR PRICES?—Editorial in the *Items of Interest*, August: "Some dentists are in favor of so much an hour. But there are only a few who can maintain this with dignity and success. To have it generally understood that your price is, for instance, four dollars an hour, will look extravagant to many patrons.

And yet an intelligent dentist should not average less while at work." * * * "A dentist of this city, for some years, has charged ten dollars an hour, and is almost constantly engaged. He has a class of patients who will not be offended at anything but a refusal to be served." * * * "In estimating prices for dental work, time, skill, material, and the ability of patients should all have their influence. * * * We think the better way is to have as far as possible, fixed prices for specific operations and as a rule adhere to them."

Speaking of prices or incomes brings to mind the following which appears in the *British Journal of Dental Science*, for July 15, 1884:

SIR: In the May issue of your journal, page 152, under title "Income of American Dentists," viz.: A trans-Atlantic writer gives as average incomes: Small country towns, from three hundred to four hundred a year, in a populous country town twice this; while in cities, incomes from twelve hundred to six thousand a year in the case of the successful fashionable dentist.

The above in reference to the cities, is not a fair average. The above writer does not explain whether these amounts are in dollars or pounds, but, be it pounds, I think he is quite out of the way. In New York city alone, we have several dentists whose incomes are over two hundred thousand a year; a better or more accurate average would be about sixty thousand dollars a year. Yours, etc., WM. A. MILLS, D. D. S.

Baltimore, Md., June 23, 1884.

We think that the first writer is nearer correct than Dr. Mills, provided he means pounds. Small country towns, from fifteen hundred to two thousand dollars a year, in populous country towns twice this; while in cities incomes range from six thousand to thirty thousand dollars a year in the case of the successful reputable dentist.

AT SARATOGA. This is the title of the first editorial in the *New England Journal of Dentistry*:

"If a physiognomist had stood at the steps of the town hall in Saratoga, during the days of August 4, 5, 6, 1884, would it have been possible for him, without looking at the signs of dealers, from the character of the faces of the men entering, to see what professionals were gathering here? They were no ministers, in spite of a few white neckties and black cylinder hats; no school-masters, for they looked too prosperous; no trades people, although white beavers were quite numerous; they might have been taken for physicians, but they did not show hollow conceit and mental impertinence enough to be that; it would have been very difficult to make out the character of the meeting." As nearly all of the contents of this number relate to the Saratoga meeting, it is useless to quote, as the ARCHIVES has a full report.

THE EDUCATIONAL PROBLEM—VICTORY. Editorial in September number of the *Independent Practitioner*. The editor says:

"If this were a political weekly, instead of a staid scientific and professional journal, the *Independent Practitioner* would probably hoist at the head of this column a rampant rooster, in celebration of the long step in advance made by the Association of Colleges, a report of whose meeting may be found in this number.

The accomplishment of the event is one in which this journal takes some pride for we believe it has been largely instrumental in bringing it about. Our readers may now know for what purpose we have given space to the various articles upon this subject, contributed by both European and American writers The Degree of Doctor of Dental Surgery is distinctly an American degree. * * * In an evil hour some of our colleges agreed to accept twelve years' practice as the equivalent for one term of schooling. The downhill road once entered upon, further reductions followed. The practitioner of *five* years' standing was accepted as a second year student, and soon the five year practitioner was only required to show himself occasionally at lectures. It was but one step further to allow the practitioner to present himself for graduation upon a mere examination at the close of a term, and this in many cases degenerated into mere form.

"There was but one deeper depth in college degradation, and the diplomas of regularly chartered schools were soon almost openly offered for sale." Dr. Barrett says: That a diploma of a college is not an indication of the acquisition of a given amount of practical knowledge, but the evidence that the graduate has pursued a specified course of study. If this is the case, then do away with the examination, and simply keep a record of the attendance upon the lectures. The session of 1884—'85 is the last one in which five years practice will admit a student to the senior class, thus doing away with the opportunity to abuse this privilege.

PROFESSIONAL SUCCESS FROM A BUSINESS STANDPOINT. By Lee S. Smith, Pittsburgh, Pa. Read before the Odontological Society of West Pennsylvania and published in the *Ohio State Journal.* Mr. Smith is a dealer in dental goods, and from his long association with our profession is able to give us good advice; here is one of our failings. He says: "There is one more point in which I am satisfied many members of the dental profession are deficient, and that is in looking almost exclusively to the professional side of their business, by performing excellent operations and studying to give entire satisfaction, and then neglecting the equally important side of the question, in their interests, by fearing to conduct their business in a business like manner.

"I have heard dentists, who have excellent practices, say that they had plenty to do, but that their patients did not call and pay bills.

When asked if they had any system of sending bills and statements, they answered:

"'Oh, no! I would be afraid of offending my patrons.' I have said to such, 'How is it with you?' Is your tailor, grocer, or others with whom you deal (if you buy on credit) afraid to send in his bills and statements, and then follow them up with his collector? Not at all!'

"My friends, by adopting business principles and systems,for the conduct of your business, you will not only be better off, and have your affairs in a more satisfactory shape, but you will gain the respect of the better class of business men with whom you come in contact."

FUN.—Dr. Watt likes to give us something to laugh at, hence he gives us the following two items: "A scientist says that man is nothing more than a fly, except in the matter of avoirdupois. This may be so, but one pesky little fly can have more fun with a dozen bald-headed men than one man could have with a million flies."

NEW ENGLABD JOURNAL OF DENTISTRY,—Editorial on Dr. Billings: "How to write for the Periodicals."

1. Have something to say.
2. Say it.
3. Stop as soon as you have said it.
4. Give the proper title to your paper. "Remember this and " stop when you have said it."

CHILDREN'S EYES, by Dr. A. W. Calhoun, President of Georgia Medical Association. This paper should be read by every teacher and parent in the land and its teachings, if put in practice, would prevent untold suffering.

"GENTLEMEN," said the Professor to his medical class assembled in clinic, "I have often pointed out to you the remarkable tendency to comsumption of those who play upon wind instruments.

"In this case now before you we have a well-marked development of lung disease; and I was not surprised to find on questioning the patient that he is a member of a brass band. Now, sir," continued the professor, addressing the consumptive, 'will you please tell the gentlemen what instruments you play on?" "I blay der drum," said the sick man.

FILLINGS FOR DECIDUOUS TEETH, by Dr. A. H. Best. He thinks that the best results are obtained by using a good amalgam.

A FINE PREPARATION OF IODOFORM.—The *Items of Interest* gives the following from Dr. A. P. Johnston of Anderson, S. C.:

℞	Iodoform, - - - - - - -	$\frac{1}{25}$ gr.
	Camphor, - - - - - - -	$\frac{1}{4}$ ʒ.
	Alcohol, - - - - - - -	1 ℥.

Dissolve the camphor in alcohol, then add the iodoform.

Now, if the filings of celluloid are added to this mixture in sufficient quantity to make a thick collodion (the celluloid will dissolve in about six hours) you have one of the best materials to apply to an exposed pulp before capping with oxy-phosphate. Also, it is first-rate for closing the apicial foramen and canaliculi of the teeth.

H.

SOCIETY NOTICES.

DENTISTS' BENEVOLENT ASSOCIATION.

The first annual meeting of the above organization was held at Sweet Springs, Mo., July 10, 1884, President Dr. C. H. Darby in the chair.

About twenty-five members in attendance.

The report of Secretary and Treasurer received and approved.

The following officers were elected for ensuing year.

PRESIDENT.	
Dr. C. H. Darby, - - - -	St. Joseph, Mo.
VICE-PRESIDENTS.	
Dr. F. Swap, - - - - - -	Boonville, Mo.
" J. J. R. Patrick, - - - -	Belleville, Ill.
" W. H. Eames, - - - - -	St. Louis, Mo.
" R. E. Nickles, - - - - -	Salina, Kan.
" J. W. Reed, - - - -	Butte C'y, Mon. Ter.
Mr. F. X. Combs, - - - -	Chicago, Ill.

SECRETARY AND TREASURER.

Dr. R. I. Pearson,	Kansas City, Mo.

BOARD OF DIRECTORS.

Dr. A. H. Thompson,	Topeka, Kan.
" J. A. Price,	Weston, Mo.
" J. M. Austin,	St. Joseph Mo.
" Geo. H. Cushing,	Chicago, Ill.
" G. W. Tindall,	Kansas City, Mo.
" C. B. Hewitt,	" " "
" J. D. Patterson,	" " "
" H. S. Thompson,	" " "
" A. C. Schell,	" " "
" I. S. Letord,	" " "

This Association is duly authorized by charter from the State of Missouri to carry out the objects of its organization. Composed exclusively of those identified with the Dental Profession and having no salaries or other excessive expenses to meet, it offers to those eligible to its benefits a cheap and reliable means of providing for their families in case of death. For further information, address,

R. I. Pearson, Sec'y,
2206 Troost Ave., Kansas City, Mo.

EXTRACT FROM PROCEEDINGS OF THE SECTION OF ORAL AND DENTAL SURGERY OF AMERICAN MEDICAL ASSOCIATION, 1884.

Reported by John S. Marshall, M. D., Secretary of the Section.

"Over-draught of Vital or Nervous Power, as Affecting General or Special Health;" by Dr. Jacob L. Williams, Boston, Mass.

SYNOPSIS.

The relation of reserve strength or nervous power to the general health and to the harmonious working of all the functions and faculties, every practitioner has constant occasion to observe. To him it is a great source of reliance for recovery from abnormal conditions and for continued health.

The diseases of different parts of the body have given rise to the various specialties in practice, all of which, when properly considered, have their relations to the general laws and forces controlling the system, and the question may be asked whether in some special departments these general laws are not often overlooked in the absorbing attention given to local disease.

It may be proper for the various specialties to elaborate and demonstrate each for itself the relation to which I have referred; but my present purpose is to make a few suggestions with regard to this matter as affecting some of the conditions of the oral cavity.

· I say reserve nervous strength, for that is what must be drawn upon in any contest between health and disease. Temporary fortification with artificial tonics alone, gives no lasting victory.

No doubt a large proportion of the people in the artificially active life of our civilization, are maintaining an appearance of fair health, while using up every day all the reserve nerve force they have; consequently are liable to succumb at the first extra demand made upon their reserve strength. This fact is also constantly made manifest in our observations of the teeth and mouth of individuals who, whether from a constitutional disposition to over-activity or from obligatory or voluntary overwork, are drawing too heavily upon the vital forces, for in no other way can some of the persistent abnormal conditions of these organs be accounted for.

Take the very common case of the business or professional man made dyspeptic from overwork. He is advised "to be careful of his diet," etc. This advice is followed, but he still keeps up his habits of overwork, and the diseased condition is not cured. Then rest is directed, and if taken in the right way improvement begins. Now, the idea is rational and seems capable of proof, that not only the gastric fluids but the secretions of other parts of the digestive system are abnormally affected by the same causes.

In cases such as the one just referred to, a greater or less tendency exists to unhealthy conditions of the oral secretions, which hold in solution fermentive material, and must as a chemical necessity sooner or later, cause damage to the dental organs. This condition most commonly follows a continuous rather than a temporary over-strain, though I have seen cases of very rapid results from great nerve exhaustion.

Would suggest that the tendency to rapid decay of the teeth might be an aid in the diagnosis of obscure nervous affections.

The relationship of cause and effect I have repeatedly seen strikingly illustrated in young persons, who are more susceptible in this respect than adults, so that now I commonly expect to find more and greater activity in the mouths of young scholars in the spring and early summer, after a winter season of unremitting application to study and exciting amusements, than in the autumn on their return from a summer vacation of leisure and rest.

Several cases illustrative of the above facts were described.

A similar condition of the mouth very commonly exists, as is well known, during pregnancy.

Another pathological condition in the mouth, which I have seen follow or accompany this exhaustion of vital force, is neuralgic pains at the roots of the teeth, particularly at the roots of the inferior central incisors, the pain in some cases extending along the line of both jaws; the teeth, however, appearing healthy, and giving no indications of diseases under the usual tests. When this disturbing cause is continuous for some time, I have noticed its liability to be followed by some degree of loosening and unsteadiness of the teeth even when not accompanied with salivary calculus or any evidence of alveolar necrosis. This condition is no doubt sometimes taken for pyorrhœra alveolaris, and the heroic treatment adopted results in an aggravation of the malady.

DISCUSSION.

Dr. T. C. Stellwagen, Philadelphia, Pa.—I am always pleased to find an association of dental surgeons willing to discuss other questions than the mechanical one of how to fill a tooth. It is refreshing to listen to some of the papers presented to this Section, and that of Dr. Williams has particularly pleased me. As a profession we have been inclined to overlook the importance of avoiding an estimate of the amount of nervous strain our patients are able to bear. There has been an undue interest shown in performing faultless mechanical operations, to the detriment of that most important question of the amount of the physical ability of the patient, which every surgeon should regard. Who has not seen a patient entirely exhausted after a long and tedious sitting for filling with gold, and remain prostrated for several days. Many indeed are utterly unable to endure such strain upon their nervous system. For such sufferers plastic filling materials have served an excellent purpose, and without them many teeth would have been lost.

This paper has also recalled some observations that I made upon "Climatic influences, and their expression in the oral cavity." I have not infrequently seen cases in which there were rapid deteriorations of dental tissue, probably the result of climatic influences, as was apparently proved by the arrestation of the pathological conditions following a change to the air and method of living in the mountains or upon the sea-shore.

(Two cases were described which seemed to aid in substantiating the views advanced by the speaker.—*Reporter.*)

He also spoke of the importance of examinations as to the conditions of the dentine to determine the progress of certain chronic or tedious diseases, and thought the removal of a filling to test the density, etc., of the dentine underneath would often prove of valuable assistance to general diagnosis and prognosis.

Dr. Marshall.—I hope Dr. Stellwagen will continue his observations in this direction, for they are certainly interesting, and I am sure the Section would be glad to listen to a paper upon this subject at any time. Perhaps Dr. Stellwagen will be prepared to do so next year.

Dr. Stellwagen.—I cannot promise for the next meeting, but may be able to at some future day.

Dr. Fredrichs.—I am very glad that Dr. Williams has called attention to this matter. It is worthy of more thought that has been spent upon it by the profession in general. I distinctly remember one patient, a little girl, who suffered from cerebro-spinal fever, induced by the nervous strain incident to a long and tedious dental operation. The child recovered, but was an invalid for months. Such experiences ought to teach us a valuable lesson.

Dr. Allport.—In my early practice I was in the habit of paying little regard to the condition of my patients when presenting themselves for dental operations, but latterly have seldom subjected a child or a frail adult to long, tedious operations, and then only under the most urgent necessity. I prefer to use some plastic filling material, like the phosphate of zinc, or gutta percha, and occasionally amalgam.

We have been apt to laugh at the operators known as "new departure" men, but we must confess that plastic operations have done very much to alleviate the sufferings and preserve the teeth of individuals just mentioned. I think it much better to use plastic fillings in such cases, and renew them as occasion requires until the health or nervous system is sufficiently strong to endure the strain of a permanent operation.

BIBLIOGRAPHIC.

TRANSACTIONS of the Dental Society of the State of New York; Sixteenth Annual Meeting, May 1884. Committee on Publication, J. Edw. Line, F. French, W. C. Barrett.

We are glad to note the early appearance of this volume, and in this connection we call attention to the general improvement in the date after adjournment at which the annual volumes of the transactions of dental societies now appear. So long as the journals are not expected to publish the transactions of societies, in full, it is very desirable that they should appear at the earliest possible date, that the valuable matter which they usually contain, may be presented to the profession without unnecessary delay.

FORMATION OF POISION BY MICRO-ORGANISMS. By G. V. Black, M. D.. D. D. S.

This is a book that cannot be disposed of in a few lines, and as it came to hand just as we were about closing the present number, a suitable notice of its contents must be deferred till our next issue.

ESSAY ON DENTAL EDUCATION. By Professor R. B. Winder, of Baltimore. Read before the Southern Dental Association at Lexington, Kentucky. 1884.

If we were asked to point out the best essay upon this "well worn" subject that has come under our observation, we should certainly point to this as the one most in agreement with our own views, and hence in our judgment the best.

MASTICATING AND SECTORIAL TEETH A COMBINATION OF CONES.

In a paper read before the Manchester (Eng.) Microscopical Society entitled, "The Forms, Origin, and Development of the Teeth," Dr. Parsons Shaw distinctly formulates this doctrine. It has been vaguely hinted before, but never so clearly stated as in this paper. It would have been well if Dr. Shaw had gone into the subject more fully, especially in regard to the origin of the human teeth, by means of this combination. The proposition demands full investigation. The whole line of argument adopts, without hesitation, the theory of development as advanced by Darwin.

After pointing out that the predecessors and the equivalents, the ancestral forms and the analogues of the structure we know as the teeth are found among the earliest products of the animal economy in the form of the chitinous, horny and other substances at the extremities of the appendages and around the mouths of most creatures; and that these are ingeniously contrived for seizing, holding and dividing the prey, Dr. Shaw says, that it is in fishes we first "begin to discover distinct dental structures formed around the maxillary arches. It is true that in the lowest forms—such as the glutinous hag, and kindred species—the dental system is represented by only a single tooth; but as we progress upwards we find an almost endless variety of dental structures. So that, as Dr. Richard Owen says, 'In form, substance, situation, and mode of attachment, fishes offer more striking modifications than do those of any other class of animals; and the anatomist finds a difficulty in obtaining a command of language sufficiently varied to portray the singular diversity and beauty, and the interesting physiological relations, which are manifested in that part of their organization.' But while there is such a variety in the teeth of fishes, a great many of them are in shape simple cones. The office of these cones is almost wholly prehensible, and they answer the purpose required so long as the animal lives on food that is swallowed whole. But when the food has to be divided into pieces, new forms of teeth are developed. First, we find the cones attaining great size, as in the canines of the carnivora, for the purpose of seizing the prey and tearing the flesh; and moreover these tusks eventually become weapons of attack and defence. Next we find the cones coalescing, so as to form the 'sectorial' or scissor-like teeth of the carnivora. These teeth seem to be formed expressly for the division of the flesh. Then we find another combination of cones, to form what Dr. Owen calls the "tubercular molars," which are used to crack the bones to get at the marrow, as seen in the dog, hyena, etc. The coalescence of the simple cones to form the teeth of the carnivorous and omnivorous animals must first commence in the union of two or more of the germs from which the teeth arise, although we are as yet unable to fully demonstrate this proposition. For we find the crown of these teeth made up of a number of cones fused into one, over which the enamel has flowed, following the elevations and depressions caused by the points of cones projecting beyond the general mass; and then, when the crown has formed, we find the fused tooth germ again partially separating to form the roots of human and other teeth. But this separation is by no means regular.

"When the animal becomes herbivorous a yet greater differentiation becomes necessary; for there must be large and flat teeth with rough surfaces to grind the food into fine particles. Therefore, a varied, involved, and complex dental system prevails among the hoofed quadrupeds. The specimens of the teeth of the elephant, cow, horse, rhinoceros, ibex, and wappiti deer will give a good illustration of their general structure. The coalesence has in these teeth been carried very much further than before, and it has produced an entirely new combination in the hard parts of the tooth. We have, in the first place, the same kind of coalesence whereby several cones make up one tooth. But, in addition to that, we have several of these teeth, each with its own germ, uniting to form one huge grinder. Thus we see in a horse's tooth no less than five teeth united to make one. This union may be described as if the fingers and thumb should get joined together just where they meet, and then a substance should flow all through the interspaces and around the outside, just as the cementum flows into all the interspaces of these five teeth, and all over the crown, forming a square tooth, as in the horse. By this arrangement, instead of the enamel being on the outside, as in the human and many other teeth, it runs all through this complex structure. The effect of this arrangement is that the softer cementum gets worn away almost as soon as the tooth is erupted, and continues to wear down faster than the other structures; then the dentine wears away the next, and the enamel, as the hardest part, wears last, which always leaves on the grinding surface of the crown an uneven surface, particularly adapted for grinding the food. Look at the sharp projections in a deer or rhinoceros tooth. What cannot such an arrangement do in the way of mastication The deer and the ibex have teeth made up of but four instead of five teeth, as in the horse.

"According to Gegenbaur, the ancestry of the whole dental system can be traced back to the placoid scales of fishes; and this view has been adopted by the best authorities. Of these scales Gegenbaur says they have 'the structure of dentine, are covered by enamel, and are continued into a plate formed of osseous tissue.' Therefore, he calls them 'dermal denticles.' But how do structures that originate on the external surface for protection eventually develop on the internal surface for purposes connected with digestion, and assume such different forms? This is not difficult to understand when we remember, first, that the mucous membrane is only a differentiation of the skin; and, second, that constant variation to suit varying conditions is the order of life. As scales are formed on the skin of fishes we can see how easily they might extend beyond the border line which divides the external from the internal coating aud spread over the mouth. Now, once begin the development of hard substances in the mouth, if we but allow the inconceivable ages which the comparative anatomist tells us have been required for the development of the higher animals, and the long succession of ever-changing environment which all animals are constantly passing through, it is not difficult to imagine how the primitive forms became gradually modified from dermal scales into dermal cones, and then, starting from that simple form, became further modified in the way I have pointed out, so as to become adapted to the various kinds of work they have to perform. And in this way I think we can account for the different varieties of the teeth, while they retain some of their primitive characteristics."

The whole line of argument adopts, without hesitation, the theory of developement as advanced by Darwin, and Dr. Shaw concludes his paper by saying. "Many may object to some of my conclusions, and even the proved facts, for the reason that they involve this doctrine. In reply, I can only say that where there is an ardent wish to know the truth, a real reverence for things sacred, and a profound love for the Divine Creator, as the laws of life are studied, and the conclusion accepted that they are revealed through the order which evolution indicates, so far from a check being given to holy aspirations, the mind will have reached a new stand-point from which to contemplate the wonderful mysteries of His never-ceasing wisdom and goodness.

TRANSACTIONS of the Louisiana State Medical Society at its Sixth Annual Session. held ar Baton Rouge, La, May 21, 22, and 23, 1884.

The proceedings of this society show that it wisely stepped aside from the usual routine followed by medical societies, and invited essays from others than practitioners of medicine. The annual oration was delivered by Col. K. A. Cross on "The Scientific Method." This is a very able and interesting paper, and its reading must have afforded the members much intellectual delight. The general drift of the paper is adverse to modern agnosticism in science, and an earnest plea for the recognition of the operation of Divine Law in the works and forces of nature.

Another interesting paper was by Dr. A. G. Friedrichs, a practicing dentist, his subject being "Deciduous Teeth."

That most medical men betray a lamentable lack ot knowledge concerning the teeth, both deciduous and permanent, is well known among dentists. The excellent paper of Dr. Friedrichs, which we transfer to our columns, is well suited to aid in enlightening medical men on this important subject.

PAMPHLFTS.

Annual Announcement of the Indiana Dental College, Indianapolis, term 1884-85.

Twenty-Second Annual Announcement of the Philadelphia Dental College and of the Hospital of Oral Surgery, Philadelphia, Pa. Session of 1884, '85.

Fourth Annual Announcement of the Kansas City Dental College, being the Dental Department of the Kansas City Medical College. Session of 1884-5, Kansas City, Mo.

EDITORIAL.

The *New England Journal of Dentistry* for October, will contain the following

ANNOUNCEMENT.

"For some weeks past, we have had under consideration an important change in the affairs of this journal; as a result we have to announce that this number will close the existence of *The New England Journal of Dentistry*, *per se.* Arrangements are effected by which this journal and THE ARCHIVES OF DENTISTRY are to consolidate. Several months ago "The Dental Journal Association" was organized and chartered by leading members of the profession in the West, for the purpose of publishing an independent dental journal. It purchased, as a nucleus, the *Missouri Dental Journal* and has issued its ninth number under the title of THE ARCHIVES OF DENTISTRY. After mature deliberation the publishers and editors of *The New England Journal of Dentistry* have decided that the interest of the profession may be best served by uniting their forces with this "Association;" and for the purpose of giving our subscribers an opportunity to form the acquaintance of the combined journal, they will be supplied with it for the balance of the year.

The Association will have the entire control of the editorial work of the journal, but arrangements have been made with J. H. Chambers & Co., of St. Louis, Chicago and Atlanta, for a term of years, for its publication. The whole country is being organized for editorial work and no effort will be spared, by editors or publishers, to make THE ARCHIVES a national journal, acceptable in every sense to the profession.

In thus merging ourselves with the ARCHIVES OF DENTISTRY we take no backward step; it is, rather, an important step forward, and one that, is, in a certain sense imperative. *The New England Journal of Dentistry* was started in a modest way; and with special reference to local interests, as its title implies. On its third issue, however, it became self-supporting, and it has had a steady and sure growth until the present time when its circulation has vastly overflown the limits of its implied territory. In attempting to adjust ourselves to this new demand upon us, we believe we have effected by this combination the best possible arrangement.

We have many thanks to offer the friends of the *New England Journal of Dentistry*, and in taking this step we are doing that which results will show to have been the wisest. Our advertisers will surely suffer no loss by this arrnngement, as the new publishers will fulfill the terms of our contract in every detail.

Subscribers will be furnished with an index to this volume in due time."

[The editors of the *New England Journal of Dentistry* will by no means discontinue their labors in behalf of dental journalism. On the contrary, being now relieved of the burden of publication, and the editorial drudgery connected therewith, they will be free to direct their energies to literary work, and will be thus enabled to excel, in amount at least, the very excellent work they have heretofore done. That their contributions will add very largely to the interest and worth of the combined journal need not be stated.

The former contributors to the pages of the *New England Journal of Dentistry* will be retained and a number of new and valuable names will be added to the list. We congratulate our readers on the accession of this strength to the regular staff of our journal, and we trust we shall be pardoned if we indulge in a little self-congratulation at the consummation of so important an object.]

EDITORIAL NOTES.

Mr. Lawson Tait of Birmingham, England, a man who holds the highest rank in abdominal surgery, recently delivered an address before the Canadian Medical Association on his favorite topic.

In the course of his address he compliments American surgery as follows:

"In my early days the medical education of a British youth was not considered complete unless he had made a tour of the schools of France and Germany, and like others, I felt of myself as was said of Proteus:

" 'Twould be an impeachment to his age,
In having known no travel in my youth."

"But I wish now that the time and money therein spent had been directed to the western instead of the eastern hemisphere or continent; and I now venture to predict that ere long it will be to the medical schools of America rather than to those of Europe, that our students will travel, as did the apprentices of old before they settled down to the serious exercise of their craft.

"American visitors abroad who have given weeks and months to see me work, have one and all impressed me with their possession of that feature of mind which in England I fear we do not possess, the power of judging any question solely upon its merits, and entirely apart from any prejudice, tradition, or personal bias. No matter how we may struggle against it, tradition rules all we do; we can not throw off its shackles, and I am bound to plead guilty to this weakness myself perhaps as fully as any of my countrymen may be compelled to do. I may have thrown off the shackles in some instances, but I know I am firmly bound in others, and my hope is that my visit to a freer country and better climate may extend my mental vision."

How eminently true is this of dental surgery, as well as of general surgery and medicine! That the English mind is oppressed with what they call "conservatism," but which is only another name for "prejudice, tradition or personal bias," is so evident that one only needs to look into their current literature to find ample evidence of its retarding influences. Read the after-dinner and other speeches that are made at the meetings of their dental societies, with the reports of which the dental journals of that country abound, and compare them with similar efforts in other countries, and the differences are so marked that they can only be attributed to some such cause. The English are a remarkable people, but they are so bound down and crippled by conventionalities and forms, and withal so egotistical, that they are, first, unaware of the shackels with which they are bound, and, second, would not probably break them, even after they were compelled to acknowledge, as Lawson Tait does, their existence.

In the British Journal of Dental Science Dr. Price says, "In England dental art and dental skill are not appreciated or utilized to the same extent they are in America. The public in England are ignorant of our ability both to save and to restore the teeth, to give back to the features their lost expression,and to the face its beauty; to mitigate pain, and to cure the acutest suffering when all other skill would be unavailing. * * * If the public is ignorant of our resources it is our duty to bring a knowledge of them within its reach. The importance of the teeth, how to preserve them, and the value, both for appearance and health, of artificial to replace the natural teeth, should be made known in every home and taught in every school."

THE

Archives of Dentistry.

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ORIGINAL ARTICLES.

"Of all the arts in which the wise excel,
Nature's chief masterpiece is writing well."

A CONSIDERATION OF THE RELATIVE MERITS OF WATTS' CRYSTAL GOLD AMONG FILLING MATERIALS.

BY J. F. P. HODSON, D. D. S. NEW YORK.

Read before the New England Dental Society at its Twenty-Second Annual meeting, held in Boston, Oct. 2 and 3, 1884.

MR. PRESIDENT AND GENTLEMEN—It is with much diffidence, and yet with a lively sense of the honor you have conferred upon me in extending to me the special and very kindly invitation to appear before you, that I am here to-day, and, while thanking you for the distinguished courtesy of which I am the object, cannot but feel how very greatly you might have bettered the selection of your object than your subject. For, very truly, there are few, if indeed there be any, which ought more properly to engage our most serious consideration, than the comparative merits of filling materials for the teeth, as few I think will question, that whatever our surgical or other dental skill or ability, the perfect stopping is, in a very real sense, the *ultima thule* of all dentistry.

As, however, it has been very delicately hinted to me by your committee that your especial hunger is for practical facts, rather than theoretical disquisition, I will plunge at once into the thick of them by the introductory premise that "Watt's Crystal Gold" is not to be confounded with any of the other so-called crystal golds which we have offered us from time to time. It is, as superbly shown under the microscope, an interlaced mass of perfect golden fern leaves, which have been grown up from, and in, the continually saturated solution of gold, by a process of electrical action. While all others that I have ever examined show no organization whatever, but are a mere agglomerated mass of gold particles, which cohere temporarily like wet sand, and are, moreover, produced by chemical action, mercury, etc., methods which were experimented with and abandoned by Watts at least 25 years ago.

I have used this beautiful form of gold exclusively for something more than fifteen years, and associated with other golds, before that time, and so say what I do know, that all operations which can be accomplished with any other gold, or by any other operator, can be at least as perfectly accomplished with this, and with less expenditure of force and strain, and indeed in every sense, with far greater ease of manipulation than with foil golds. Crystal gold possesses moreover some excellencies which do not obtain in foils, one of which is the steel-like hardness of surface of the fillings produced with it, which in grinding surfaces is so especially valuable for their resistance to, and withstanding of, the battering force of mastication, and of the cusps of opposing teeth, and in the exquisite perfection with which it adapts itself under honest manipulation to the walls of the cavity, indeed so close and perfect is it, that delicate pointings of the microscopic crystals have been shown to have entered open ends of the dentinal tubuli themselves. This waxy adaptiveness would be, under any circumstance, a most valuable attribute, but it becomes doubly so when taken in connection with the fact of the gold being condensed with so little force as compared with foil. In such circumstances, for instance, as very frail front teeth, where for appearance sake, it is often expedient to save every atom of even thin remaining enamel, the value of this quality in crystal gold is inestimable, and I wish to be perfectly understood in regard to condensation, in such circumstances of frail walls as just instanced.

The filling should be of course, and is, with faithful manipulation of this gold with small points, practically as closely adapted and as well consolidated against these walls and throughout the stopping, as if against strong walls, and all this where a proper condensation of foil would be far more likely than not, to rupture the enamel, even granting to the foil the most skillful manipulation. If crystal gold can be depended upon to do this so delicate and refined work among "egg shells," what must be its capacity for easy and perfect adaption in the great mass of the usual cavities having strong walls. I deem it a work of supererogation to enlarge upon, or even do more than suggest the point to intelligent professional gentlemen, This wonderful combination of all the compliant and waxy characteristics of "soft" foil with even more of the cohesive quality than is possessed by most cohesive golds, and superadded to this,a very hard finished surface peculiarly its own, are the especial characteristics of Watt's Crystal Gold, and from such a superb *tout ensemble* for gold filling material as that, the application of the motto "multum in parvo" seems especially appropriate.

As I have previously said, I have used this form of gold exclusively for more than fifteen years, and although I always have a quantity of other gold in my gold drawer, and, get most new varieties as they appear, and keep them more or less even on my trays, because I do protest that I despise the prejudiced and obstinate riding of a hobby, and always feel ready to use any gold or any material that I can produce the best results with, in any and each individual case. I am nevertheless wholly unable, as a general rule of every day practice, to find any place in any cavity where I can possibly employ them to any advantage as compared with crystal gold, and am constrained to store away the pellets and cylinders, etc. in the body of large stoppings from time to time, *to get rid of them.* "Aha" I hear some captious critic say "so you *do* manage practically to combine foil with your crystal gold after all." Don't think so gentlemen, I merely and truly, as I say, having kept some foil preparations for a time, I seek to dispose of the—to me—useless material, by putting it where, possibly many of you would say, it would "do the most good," where for myself I would say it could "do the least harm," in the centre of a large stopping, and precisely as I would stow away pieces of crystal gold which had become in any way somewhat condensed, and, in my opinion, unfit to place next the walls. One exception, however, to my exclusive employment of crystal gold, which I wish to mention, is my habit, as a mere matter of extra prudence, of binding together a largely built out restoration in gold, with occasional strips of heavy foil, feeling that the magnificent hardness of condensed crystal gold might possibly militate against the toughness and consequent integrity of a long, thin restoration. Beside this negative proposition as to my employing no other gold, I wish to place the positive one, that I *do*, with *very* rare exceptions use, only this; that is to say, so far from employing it only for usual operations, and then plastering up all the difficult or large ones with amalgam, I almost never—probably not nearly as often as I ought—employ amalgam, or other plastic filling materials for permanent teeth, and as seldom order teeth out. And I say all this in order to make the point, and to make it plain, that I *never hesitate about doing any operation whatever with crystal gold*, that I depend upon it for all and any dental stoppings or restorations whatsoever, small and great, easy and difficult, and that if any failure occurs (and I am not, I hasten to assure you, one of those transcendent operators who never, never have them) I *know* the failure to be consequent upon my, somehow or somewhere defective manipulation, and not any fault of the gold employed. For instance, if I were to "take a piece as large as the cavity"(as, for many years the instructions accompanying it directed, and which some operators who use it, apparently do now), and jam and plaster it into the cavity trusting to some magic of affection in the gold to seek out the walls of the cavity and cling to them, I should fully expect, as a consequence, the leaky and worthless stopping that is so often seen, and which advertises to all who see it, not the incompetency of the gold, but of the operator who essayed to place it.

Notwithstanding the beautiful, even silky, softness and pliancy of crystal gold as it takes its place in the cavity, it becomes hard under manipulation, and that very quickly, and being cohesive to the last degree, must be treated after this first placing in the cavity like cohesive foil, and, as I have said in a previous paper, if crystal gold be given the same honest care that a conscientious operator would in like circumstances apply to cohesive foil, he would surely produce the same perfect stopping, and in addition receive the benefit of the grand combination of the special beauties and advantages in both soft and cohesive golds.

It is absolutely imperative that the first pieces of crystal gold be held immovably in the position in which they have at first been placed, and retaining points, or an angle of the cavity may be employed for the purpose. My own very decided preference, however, and the method which I employ wherever possible, is to arrange to hold the completed stopping by the general shape of the cavity, rather than by means of the deep pits so often employed, as I greatly deprecate any so unnecessary reaching out toward the pulp with conductive material, as are these retaining points when filled. In this case the first pieces may be held accurately to their position, by means of a pointed instrument in the left hand, continuing its employment till in condensing these first pieces, and proceeding with the stopping, the shape of the cavity is found to hold the gold securely without it. Condensing each piece finally as one progresses, exactly as a careful operator would proceed with cohesive foil, for as I have before remarked crystal gold, *when first applied to the cavity*, is waxy and adaptive as is the softest of soft foils; but there this similarity ends, as it should, and this first application being once made, it must be treated thereafter precisely as though it were cohesive foil.

A good operator when applying a cohesive foil pellet to the cavity would not proceed to disintegrate it by punching it full of holes with a sharp point; neither would he on the other hand attempt to model large thick pieces of it into position with "spoon" modellers and expect anything but a worthless uncondensed cavity-full of something akin to loose shavings or sheet iron scraps as a result. Neither would he jam a large mass of cohesive foil into a cavity, and by thrusting wedge shaped instruments down through it, expect to force it to spread out sidewise and form the perfect adaptation to the walls of the cavity which the merest professional child ought to know is the *sine qua non* to the saving stopping, and yet gentlemen do all of these things, commit all of these sins against crystal gold, and then cry all maledictions upon this gentle material, for the results, forsooth. "You miserable lamb," says the wolf, standing in the stream above him; "how you have roiled up and spoiled this water for me. I will therefore destroy you."

If gentlemen would but—for instance—take the cake of gold carefully and gently between the fingers of the left hand, and, with long pointed tweezers in the right, as carefully push off-without too close approximation of points of the tweezers—a trayful of small pieces, and then, the rubber dam being in position on the tooth, of course, the cavity dry, etc.—take up one of the pieces on the end of such filling instrument as would be employed were cohesive foil pellets being used (in any shape, so that 'tis small, and is very finely serrated), carry it through the annealing flame, and to the position in the cavity where it is designed to commence the stopping, hold it absolutely still, until it has been fully and entirely condensed, employing any means of condensation which would properly consolidate pellets of cohesive foil, add other pieces, in the same manner, still holding the compacted portion immovably, until it will of a certainty hold itself, adding no single piece however, till that already in the cavity has been fully and finally consolidated, never changing the position of any pellet after its first application to its place, using so small pieces as to be *sure* that no piece is added which, from its size or thickness, they could not, with absolute certainty, condense throughout its substance, without chopping or punching it full of holes, packing directly against the walls of the cavity, and remembering that no cohesive gold spreads or wedges out under manipulation like soft foil, and that consequently all packing must be done directly upon the part desired to be compacted.

In a word, proceeding throughout the operation precisely as though it were cohesive foil pellets which were being employed, and, my word for it, they will be surprised and delighted to find how they would be accomplishing the same results with this gold as with foil, and with how much greater ease and pleasure and delicacy they were doing it.

If then they continued to the end of the placing of the gold and polishing and finely finished the exposed surface, they would find in that such resisting steel-like hardness as is implied in the fact that a patient will return days afterward to have a mere nothing taken off from the surface; *they can't hammer it down*, slight excess tho' it be.

My own preference has always been for No. 1, in contradistinction to the more condensed Nos. 2, 3 and 4, and for such delicate handling of even this, as that it shall certainly *be* No. 1, when it reaches the cavity, and not have been handled and pressed into the equivalent of No. 3 or 4; as the very essence of the value of crystal gold—to my mind—lies in the tremendous difference in bulk between the exquisitely soft silky state in which it comes to us, and its finally consolidated one in the cavity, and that the great change taking place under the guidance of the instrument of the operator implies all of the possibilities of the marvelously close adaptation to the walls of the cavity of which I have spoken, but which superb attribute of crystal gold is deliberately thrown away, to start with, by using the condensed Nos. 2, 3 and 4,and equally so, by the careless handling and squeezing of No. 1. In short I want to do all of the condensing *in the cavity.*

The ultimate destination of us all, with our varied methods and golds, is the goal of the perfect stopping or restoration, and each being devoted to his own method, and becoming skillful in it, it becomes *his* best one, and we may learn much from these specialists, even tho' we ourselves may either not be specialists, or that we even do not at all employ his particular method.

The soft-foil operator teaches us much about adaptation. The heavy foil man—I'm a little lame here—perhaps the want of it. The cylinder operator about rapidity of operating. The electric foil man lauds its lead-like ductility. This cohesive foil man his general power to restore beyond the cavity, *chacun a son gout.* But it is obviously unfair for one man to test another's method or material by his own manipulations, and then depreciate Pegasus, because forsooth he don't yoke with his ox!

There are many different ways of getting from New York to Liverpool, and, barring accidents, one reaches there certainly, by any one of the many lines, but as between them, ones comfort and pleasure on the way, and his condition upon arrival there are questions upon which each will have his own opinions and predilections; but supposing one to have been long accustomed to the cabins of a "Cunarder" or an "Inman Liner" in his passages across, and upon the representations of a "White Star" patron, decides to try—say—the "Germanie." It is certainly very unhandsome in him, not to say ridiculous, after having heedlessly stumbled down into the hold at the beginning of the voyage, and as heedlessly remained there to the end of it, to go stamping about Liverpool upon his arrival out, exclaiming against the manifest discomforts of the White Star Line and his passage on it, that he was rolled and tumbled about, cut and bruised till he was "all broken up," and indignantly repudiating a suggestion as to his being "tight," or that he had been in that—to him—detestable condition from the first, declaring that indeed he was so very badly off, that he must now go into hospital to be made over new; and that if there was any one thing sharply defined in his mind, it was that he would never, never use that method of getting to Liverpool again.

"What's that you say; elegant promenade deck and superb sleeping and dining cabins; reading-room and smoking-room and all that?"

"I don't believe it. I never found 'em."

DISCUSSION.

Dr. Fillebrown.—This paper of Dr. Hodson's is so complete in itself there seems to be nothing to say in addition or discussion. I honor a man who has devoted himself to one line of thought or practice and developed it to such a degree of perfection as this; and a so well digested and clear an account of that work, as is the paper just read, I prize very highly. Dr. Hodson's practice illustrates very forcibly the fact, which we all appreciate in some degree, that satisfactory results may be reached by totally different methods. That the doctor obtains good results goes without the saying, for he is one of the very best operators among us.

In my own practice I rely mainly on cohesive gold foil, used in a very attenuated form, one fifth of a sheet of No. 4 rolled into loose ropes and cut into lengths to suit. This is so plastic that it will easily go anywhere a point will follow. I use other forms of gold incidentally—more than that—frequently, in almost every cavity, and crystal gold is always on my case and is often used. Many of our fine operators make non-cohesive foil their main stay, using cohesive gold incidentally to finish with, and thus obtain excellent results. The essayist relies mainly—almost wholly—on crystal gold; using other forms only incidentally and perfect work is the result. Crystal gold I believe and know, to be a perfect form for a filling material, and the operator who takes it for his chief reliance makes a good choice. I thank the doctor for his paper and for his presence, and heartily join in his sentiment that the best way to do a thing is the way you can do it best.

Dr. Clapp.—I am happy to have Dr. Hodson present to-day and give us his experience with crystal gold. A few of us who knew something of his reputation as an operator and his almost exclusive use of this material, wanted him to come and give us the benefit of his experience. And so we have succeeded in inducing him to be here to-day, although at a considerable sacrifice to himself. It has served to bring to our attention the value of crystal gold. Hereabouts it has been much overlooked. I have used it but little. It has qualites that other gold does not possess. Asked Dr. Hodson how he uses it; whether he uses hand pressure or the mallet, etc.

Dr. Hodson.—As I said in my paper, any method of employing force for the condemnation of cohesive foil pellets or cylinders is appropriate in the same circumstances,to crystal gold. I specify pellets and cylinders because ribbon gold or simply layers of heavy foil can be beautifully consolidated with the electric mallet. Crystal gold cannot because of the superficial nature of the blow and the absence of pushing force in this instrument, and as I have pointed out, crystal gold is prone to condense a crust upon its surface under such action, leaving the underneath part of the pellets uncondensed. If I can get direct action for the mallet, I use it both for rapidity of execution and delicacy. In, however, operations or *parts* of operations where,in the employment of the mallet its action would be to drive the gold away from the walls instead of in direct apposition to them, I certainly should not use it, but should turn to hand pressure,and this happens so constantly during the day's operations, and in different parts of each operation, that I question which I most employ, the mallet or hand pressure. Both sets of instruments are to my hand and are applied to the work according to the demand of the moment.

Dr. Clapp.—I use all the various methods employed in filling, and the varieties of gold also. I fill each cavity by itself; using such methods and material as will enable me to accomplish the desired end in each case in hand. As yet I can use no cohesive gold in undercuts.

Dr. Wetherbee.—I am quite familiar with the history and qualities of crystal gold. I first used it February 7, 1855. The crystal gold of that day was very imperfect when compared with that in use at the present time. A good and substantial filling can be made with crystal gold.

The first point I make is this: that it requires more time, in many cavities double the time,than that of other forms of gold. If time is money, and it is so reputed, then there is a needless waste of the energies of the operator.

The second point is: that there is far greater liability of imperfection at the cervical wall than where other forms of gold are used. In the use of pellets of proper size and partially annealed we have a sufficient quantity of gold to be carried against the cervical wall, and extending beyond so as to allow of the most thorough impaction. If retained in position, other pellets may be added until we are ready for the use of cohesive foil. By this method I have a sufficient quantity of gold covering the cervical wall to allow perfect condensation. That portion of the filling being dressed down to a thirty-second part of an inch of the margin of the cavity, is heavily burnished,thereby expanding the gold, bringing it into positive apposition with the *parietes* of the cavity. If there shall be a space of a five hundreth part of an inch between the gold and the wall of the cavity which cannot be determined by the eye unassisted, it will be fatal to the filling. Crystal gold does not expand under the pressure of the burnisher, nor does cohesive foil except to a very limited degree.

The third point I make is: that in deep-seated cavities crystal gold is not so easily or so surely impacted against the labial wall of a central incisor, especially when small space can only be obtained, without serious injury to the form and beauty of the tooth. In such I invariably use non-cohesive foil. It is carried before the instrument to the point indicated and thoroughly impacted, assuring a perfect filling. This was my method when using crystal gold, and is, in like cases, my present method when using cohesive gold.

My fourth point is: that when severe wear or strain by attrition supervenes, it has not the strength or resistance of cohesive foil. It more readily wears away, leaving imperfect margins. For these reasons I long since gave up the use of crystal gold in my general practice.

Dr.Andrews.—I am very much pleased with the paper of Dr.Hodson. I am one of the "few of us" spoken of by Dr.Clapp,who wanted him to come and tell us his experience with crystal gold, because I have used it for many years, and I believe in it. I know I can depend on it. Those who think they can make good fillings of it and make them rapidly are mistaken. It needs the same skill and care that you give cohesive foil, perhaps more in filling around the edges of a cavity. I use it alone and in combination with cohesive and soft foil. If,during the next ten years I could get only one preparation of gold, I should prefer crystal to any other form.

Dr. Waters.—I wish Dr. Hodson would place upon the blackboard the appearance of crystal gold as seen by high powers of the microscope.

Dr. Hodson.—You presume me to be an artist.

Dr. Waters.—Exactly. I have no doubt on that point. Artists work to an idea, and every successful dentist does the same. He sees the end from the beginning and works towards his highest conception of what is true as well as beautiful. It is only by being good artists that we become expert dentists.

Thirty-five years ago I made some crystal gold. One of my patients was a gilder by profession. I asked him what he did with the rags with which he rubbed off the surplus gold leaf. He said they were not good for anything after he got through with them, they were so dirty; and so he threw them away. I asked him to bring me some. He did so. I incinerated them and lixiviated the ashes in aqua-regia,which, after standing some time, I decanted the supernatant fluid and then parted therefrom the gold, silver and copper. The gold was thrown down in a crystalline mass; not the light and feathery article which we now know as crystal gold, but a rather coarser article. That, I did not have skill or patience enough to work successfully. It would crawl towards the instrument with which it was packed just as the first cohesive foil did.

One of the chief hindrances in the way of making a perfect filling is the difficulty in securing a good coaptation at the periphery of the cavity. The doctor here illustrated his method of filling certain cavities by means of mats of gold made of No. 4 foil, folded and cut so as to present the edges of the foil mat at the external surface. [A cut would be necessary to illustrate his method, which we have not the time to give.—Ed.]—"I often find, in fillings that I see, a defect at the cervical wall where the surface of a tooth is depressed at the neck, the gold having been filled straight across, leaving a projecting edge, under which foreign matter accumulates, ferments, and decay is the result. In filling with cylinders of gold there must of necessity be a cuneiform space at the joining which will in the same way give a start to decay."

Dr. Hodson.—In reference to the remarks of my much esteemed friend, Dr. Wetherbee, I have but to say that I fear that much soft foil "hath made him mad," all of his assertions being in direct contradiction of everything in the paper I have read, and to my continual and daily experience of the many years in which I have used crystal gold exclusively in my practice. At the same time he informs us that the crystal gold of long ago, was a very imperfect material as compared with the beautiful one of to-day, *and* that he *long since* gave up the use of crystal gold.

I may merely say categorecally with him, that

1. Crystal gold takes no more time in the hands of one skilled in its use than does other cohesive golds in hands skilled in *their* use.

2. That perfect cervical edges and the utmost refinement of continuity of tooth substance and gold are as universally made by a skillful operator with this gold, as by skillful operators with any other; and the imperfect and worthless cervical edges are made by an unskillful or careless operator with any other gold as well as this. Cervical margins test the skill of the operator, the soft, cohesive, cylinder, pellet, mat, ribbon, and crystal gold manipulators, each being presumably able to produce perfect ones by his own manipulation of his material.

3. What I have just said applies equally to the "labial walls of the incisor teeth." The skillful operator produces elegant operations with whatever material he employs.

4. Is I think sufficiently answered by my paper which specifically points out as one of the grand and splendid attributes of crystal gold its *specially* hard and resistant wearing surface.

In response now to the request of Dr. Waters, I will try to give you a faint idea of the beauty of crystal gold under the microscope. (Dr. H. here drew upon the black-board a very graceful representation of interlacing fern leaves.)

Dr. Gage.—In my own experience there seems to be more trouble with discoloration of crystal gold fillings than with gold prepared in other forms. I would like to ask Dr. Hodson if he can account for it.

Dr. Hodson.—I scarcely know how to answer that question. It is a condition of things which I do not meet with in my own practice. Except very rarely an isolated case where foil stoppings of other operators were discoloring on their free surface in exactly the same way as my own stoppings beside them, and so I have come to feel such discoloration to be due to the action of some chemical, either formed in the mouth or taken as medicine, as chloride of iron, etc.

Dr. Chandler.—Perhaps I can throw some light on this matter of discoloration. Some years ago I went into the investigation experimentally of the discoloration of gold in the mouth. I came to the conclusion that the impurity of the gold had little or nothing to do with it, but that it was mainly, if not entirely, caused by the particles of steel worn from our steel pluggers and left upon the gold wherever it has been touched by them. If the fillings are cleaned and made bright again, they will again discolor, showing that the discoloration is not superficial but that the cause extends all through the filling. Some of my experiments showed me that an almost infinitesimal quantity of steel would have this effect. Our steel pluggers are always worn smooth in process of time. Where do the worn-off partlcles go if they are not left on the gold? An account of these experiments is to be found in *Johnton's Miscellany*, to which I sent it for publication.

Also quite lately Dr. William H. Rollins of this city has gone into the same investigation much more thoroughly. He has had expensive analyses made of the different makes of gold, and has also striven to obtain absolutely pure acids for the purposes of these analyses. This was found a matter of great difficulty, as impurities persistently clung to them. He succeeded at last, however, and arrived at substantially the same result that I did. His paper may be found in the *Medical and Surgical Journal* for September 4, 1884.

Another point which I thought I established was this, viz., that those golds,as crystal gold for example,which required the most careful manipulation, and therefore the most handling with the instruments and the longer time, are the most likely to become discolored, and *vice versa.*

Dr. Hodson.—It may be that I have "builded better than I knew" in my fear of and antagonism to iron in any form that might get associated with my fillings, and may explain why the surfaces of the fillings in the mouths of my patients are as pure and clean as are those of any of my professional brethren. I am excessively careful of the cleanliness of my plugger points; never, under any circumstances use a new one till I have surely cleaned all possible infintesimal bits or filings or scale out from the serrations, and I so greatly fear a point getting magnetic, and so attracting a bit of iron from somewhere, that I keep all magnets and magnetic instruments in a separate room. For, of course, we must keep a magnet for the purpose of magnetizing a pointed instrument to draw out the little drill point occasionally broken off in a tooth. I was once precipitated into a lot of trouble by an assistant's having heedlessly left a magnet among a drawerful of instruments. I threw them all away.

Dr. Waters.—In manipulating gold from the ingot it is often dipped in acid to dissolve off the flux that adheres to it in pouring from the crucible. Many gold beaters in former times, failing to get a pure gold—copper and iron being the impurities—were in the habit of quenching the ingot, after annealing, in a solution of sulphate of iron or sulphate of copper, and any pores in the surface of the gold would be filled by the quenching and cleaning liquid rushing in to fill up the vacuum. In beating, this would not all be forced out, and when manipulated by steel instruments the acid would come to the surface and act upon the instruments, or the impure metal would itself be dissolved. In either case a red surface of metallic copper, or a dark to a black surface of the oxide of copper or iron would result.

ADDRESS

By Prof. G. V. Black. M. D.,D. ,D, S., at the opening of the Chicago College of Dental Surgery. Oct. 1. Session of 1884-'85.

LADIES AND GENTLEMEN, AND STUDENTS: You are gathered here this evening for the purpose of beginning a series of studies by which you expect to become fitted for the practice of dentistry. The Faculty of this Institution have chosen that I give the opening lecture of the course, and in this lecture it is my duty to give you, if possible, a better understanding of your future duties in the profession which you propose to enter.

Let me state in the beginning that one's duties to his profession, no matter what that profession may be, includes his whole duty to his fellow man, and to himself. To do this duty requires honesty of purpose, sincerity in the performance of labor, and a correct understanding of the mutual relations of man to man.

These three grand requisites of success we hope each of you have gained in your previous training, so that you come to us with these qualities well fixed and ready to guide you in the special duties that devolve upon you here; for without them, no man can rightfully expect the high measure of success which all must desire.

Dentistry does not differ from the other professions in these respects. There is nothing in this profession which in any wise changes our general duties to our fellow men or relaxes the vigor with which we should labor for the general welfare of the human family; but, on the contrary, the more we learn of the infirmities of men, the stronger should our sympathy with the suffering become, and knit us closer to the rules of right doing. In the prosecution of your studies you will learn more of the mutual needs of men and more of the help that the one may render to the other. Here your study will be man. It is true, much of your time will be spent in the study of the grosser part of man, his material form, structure, and composition; but through this study we expect you to continually approach more and more toward a correct understanding and appreciation of his higher nature; the mental and spiritual. For at the very outset of our studies each of us must perceive that there is something lying beyond the material forms which we are called upon to examine. A force, if you please, that calls these forms into existence, molds their outward conformation,determines their elements, and controls their relationships.

If we examine the human hand we find it composed of bones which have a mutual relation to each other, with cunningly devised joints or hinges by which the end of the one moves upon the end of the other. These relations of the bones are maintained by numerous ligaments, which bear certain relationships to the bones, and to each other. Again, we find that these are threaded throughout by tendons, to which are attached muscles, by the contractions and relations of which the movements of the hand are accomplished. But this is not all of the hand. It is only the grosser mechanics of the hand. Like all other parts of the human frame, it contains in its make up that which is destined to minister to the life of the organ. It is pierced everywhere by minute tubes, arteries, capillaries and veins through which the blood comes and goes for its nutrition, that life may be maintained within its structure. Then we find it everywhere pervaded with nerves through which it becomes obedient to the great central organ, the brain, by which its movements are guided, and without which the whole organ, be it ever so perfect, would be entirely useless to the other organs of the body. All of these we find enveloped in the skin in which the tactile sense is located. All of the parts are woven together into one perfect whole, and all are minutely dependent upon each other.

Without any one of them, or if any become maimed or imperfect, the hand becomes useless, and the whole organism suffers in consequence thereof. For as it is with the hand, so it is with the other organs of the body. Each organ is made up of parts which are mutually dependent upon each other, and each organ is mutually dependent upon the other organs in the general make-up of the body.

Society is similarly framed. Each business or profession has its place of labor, and all are mutually related and dependent upon each other. The welfare of the community depends upon the skill and sincerity with which that labor is performed in each individual case, for it is the individual cases that make up the whole. If the physician neglects his duty, or performs it in a bungling manner,or proves incompetent through lack of diligence in preparation, an individual is injured. Society has suffered in the person of one of its members and has a right to complain. This person has also brought a reproach upon his profession. The same is true of individual actions everywhere, and in the professions especially. For we of the medical profession become by virtue of our special studies, not only the servants of, but the advisors of other members of society in matters of the gravest importance, and society has the right to demand that we be well qualified.

In all the associated parts of the animal body life is maintained. What is life? Webster defines the word thus: "That state of an animal or plant in which its organs are capable of performing their functions." It will be seen at once that this definition is based on certain of the physical attributes of life. It does not tell us what life is, but that life exists when certain phenomena are observed. We say a thing lives when we see it performs certain movements or undergoes certain processes of growth and multiplication. While this may approach as nearly a definition as we are able to frame with our present knowledge, every thinking man, must,when he ponders the subject, admit that this is not life. There exists a power behind all these manifestations that we are unable to explain. What is it that holds the elements of which our bodies are composed together, and gives to the mass its physical form? What is it that determines its cellular structure, and maintains each of these minute portions in its relations to the general mass? We say it is life. The work of nutrition is under the guidance of this peculiar force. Indeed, all the operations by which animal existence is maintained, is the work of life. Yet we can only recognize life through its manifestations. We cannot come in contact with life itself with our physical senses, although these senses constitute one of the highest endowments of life. Matter does not live. Life is a subtle power which invests matter with peculiar attributes, or rather, brings it into subjection for a time, and causes it to take on new and varied affinities leading to complex combinations for the formation of the wonderful forces which we know as animals and plants. Still in the higher sense matter does not live. This power is evident for the time in the animal or plant, and in our common modes of expression, we say, it lives, yet there is nothing there that we can recognize by our physical senses but matter. The animal dies. That power or force which we call life has departed from it, and all at once the phenomena of life have vanished. At this moment there may be no change in the matter. The organs of the body are each in their respective places. Each individual cell maintains for a time its form and composition. Death does not change the physical form. It is simply the withdrawal of that power or force by which these combined phenomena have been carried on and the form constructed. Matter may properly be said to be vivified. It may be brought under the influence of the life force. The machinist may construct a compass for the mariner. He makes his handle of steel, but without the subtle power of magnetism it is useless for the purpose intended. The electrician may store electricity in a Leyden jar, but such a jar is not electricity. He may approach a pointed steel to one of the knobs, there is a flash, and that subtle power which was stored within is gone in an instant. As a jar is not electricity so the physical body is not life. Life is a force, which under certain conditions takes hold of matter and moulds it into the physical forms of our bodies, and the so-called living forms which we see around us. The chemical affinities of matter are the playthings of life force. The molecule is torn asunder and compelled to reform with different groupings of the elements of which it was composed, that our bodies may be formed of their constituents. The roots of plants taken up mineral substances from the earth. The blades attract the elements of the atmosphere, and the grain has formed through newly acquired affinities and a peculiar combination of the elements. The grain is taken into the stomach, and a process at once begins by which its elements are torn asunder and compelled to recombine in other molecular forms for the construction of our bodies. In the chemical laboratory of the life force, the elements of earth and air become grain—the elements of grain become man.

It will be your business while here to study the phenomena of life, and the conditions which are favorable or unfavorable to their maintainance. This is the business of all medical students, no matter what their specialty. The central ideas are the same for all; no matter whether the principal practice be to amputate the shattered limb for the soldier, or to remove the carious portions of the teeth for the soldier's child. Each is striving in his special field to maintain the best conditions for the continued manifestation of life, and the comfort of the individual, under the special conditions in which he is called upon to act. Each strives to remove that which is hurtful, and place the diseased or injured parts in the best condition for future usefulness. To this end we study anatomy and histology, that we may know the structure of the different parts. To this end we study physiology and hygiene, that we may know the functions and relations of the various organs in their healthful play, the surroundings and the food best calculated to promote continued healthful action. We study chemistry that we may attain a better insight into the composition of living structures; that which may serve as foods and medicines; and that we may ward off the dangers of contact with hurtful substances.

By the study of pathology we learn to quickly appreciate deviations from health. These are presented in the utmost variety of form, and require much patient labor for their mastery. You will find in the prosecution of your labors that the laws of disease are in many respects as definite as the laws of physiology, but often even more subtle and delusive. Disease being founded in the disturbance of physiological action, to know the former we must know the latter.

By the study of therapeutics we are enabled to apply to the cure of disease those remedial agents the nature of which we learn in the study of materia medica. All these subjects are blended together in the most intimate way. No one of them can be completely divorced from the other. All are of equal importance to the student of medicine, no matter what his special field of practice. These studies form the basis of the medical knowledge of every intelligent practitioner, whether he be surgeon, general physician, gynecologist, occulist or dentist. Specialties in the healing art do not rest upon differences in the basic facts upon which they are founded, but upon the same fundamental truths; hence, the studies are in a large measure the same for all. An inflammation of the mucous membrane of the mouth may not differ essentially from inflammation of the mucous membrane elsewhere. Again,an inflammation of the knee joint may not differ essentially in its character from an inflammation of the peri-dental membrane; but the localities and structures involved are widely different, and the manipulative and surgical treatment in the two cases must be varied to suit these differences. It is upon the difference in the location of disease, the difference in the structures involve the manipulative application of drugs, and the surgical means employed, that specialties are for the most part founded. Except in the manipulative sense the differences in the application of medicine to the cure of disease has hardly proved a sufficient foundation for a specialty. Hence all the successful specialties are founded in a large measure upon manipulative or surgical treatment. It is only in the more limited sense that specialties in which surgery is not extensively employed have succeeded. The specialist in diseases of the mind would not succeed but for the fact that his patients are gathered together in large hospitals under State management. A few men by devotion to one special line of study, pursued rigidly, succeed in building up a special practice; as has occasionally been seen in nervous and mental diseases, diseases of children and the like. These specialties, if they can be so called, depend for their existence upon the person, the peculiar devotion to this special field of study, and the energy in action to create them, and usually die with their author.

The specialty of gynecology, however, is very different and will grow in importance as a specialty instead of diminish. It does not depend upon the superior power and the insight of an individual, but has grown out of the necessities of the human family and the peculiarities of the surgical manipulations found best adapted to the cure or alleviation of diseases of the peculiar organs with which it deals.

The specialty of the occulist is of a like nature. It was not until the adaptation of instruments for diagnosis and surgical means requiring special dexterity in application that this specialty rested upon a firm foundation. It could never obtain such a general sanction from the medical profession upon any possible theoretic differences in the administration of medicines, for the simple reason that these differences do not exist in nature, and therefore can not exist in matters of practice.

The specialty of dentistry does not differ from these. It also owes its existence to the peculiarities of manipulation rendered necessary by the surgical means found best adapted to ameliorate or cure the diseases of the teeth and associate parts. And it is only on the basis of these necessary manipulations, and the amount of time required for the development of the necessary skill in their performance, that we find any sound basis for the existence of any of these specialties. They cannot be founded on special knowledge of disease, and the adaptation of medicine to their cure. This class of information belongs to the medical profession as a whole.

I would not have you understand from these statements that the general practitioner must know *all* the special phases of diseases of the eye and the special adaptation of drugs for their alleviation that may he known to the occulist. By no means. We expect the specialist to expand in his own particular field, while the general practitioner gives his attention more particularly to his line of practice. This is true and should be true in all specialties of medicine, but it involves no difference in the fundamental doctrines of medical science in these various fields. Hence, the principal studies presented to the student who is preparing for the practice of the specialties, are the same as those for the general practitioner. One other reason exists for the formation of specialties in medicine, and that is the extreme frequency of forms of disease requiring special surgical manipulation. If we examine the well-established specialties, we will find in every case that the diseases treated occur with great frequency as compared with others. This is true in gynecology. It is true in diseases of the eye and ear, and it is pre-eminently true in the diseases of the teeth. Therefore,our specialty is more firmly founded upon the needs of humanity than any other. The gynecologist rarely devotes himself exclusively to his specialty. The occulist is found only occasionally outside of the larger cities, but the needs of the human family for the dentist have made him almost omnipresent. The town is small indeed that will not support one or more dentists. This is explained by the great prevalence of the diseases of the teeth.

Therefore, we find the dentist confining himself exclusively to his specialty, as a rule.

It must not be supposed that because a specialty in medicine rests in a large degree upon dexterity in certain surgical manipulations that this dexterity constitutes the medical specialist—far from it. Of what avail is an elegant operation upon the eye if that operation be not well adapted to meet the pathological state which it is intended to ameliorate or cure? Of what avail is a mechanically skillful operation by the surgeon if from lack of knowledge of pathology it is misdirected? So the mechanically skillful but ignorant dentist may make splendid operations upon the teeth to the injury of his patient, because of inability to form a correct judgment of the pathological conditions. Therefore, manipulative ability alone does not constitute a medical specialist. Without the knowledge that will enable him to diagnose clearly and apply his dexterity wisely to the alleviation or cure of pathological conditions, the man remains the veriest quack, be he ever so skillful a manipulator. Neither can we neglect the administration of drugs, for by these we supplement our surgical means of cure, and in very many cases this means of cure stands first in the list of remedies, the surgical being inapplicable or holding a subordinate position. In the years past it has been the reproach of the specialists that their practitioners failed in the handling of drugs. Why? Simply because they were not good, patient, medical students, and had not learned sufficiently well the virtue of drugs, nor gained the ability to diagnose with sufficient clearness the pathological states to which they were applicable. This was true among occulists, and has been especially true among dentists. Let me express the hope that before each of you go out of this institution to practice your specialty, you may be prepared to do your full share towards the banishment of this reproach. Very much of the time of the dentist must,in the very nature of the diseases he is called upon to treat, be given to delicate and tedious manipulations, and it should be the aim of every dental student to become very proficient in this branch of his art; but in doing this he must not neglect the close study of disease, and the remedial virtue of drugs. Young men are too apt to be carried away by the brilliancy of splendid operations, and neglect studies that are of more intrinsic value. Although so much of the time of the dentist is occupied with manipulations, he should *know first, do second.* The future reputation of each one of you will depend more upon what you have in your mind, than upon what you can do with your fingers. The specialty in medicine grows up to meet the want felt by the people. It cannot be founded upon the desire of the individual. It is the people whom we all serve, and within certain limits we must so shape our lines of practice as to meet these needs if we would be successful. This does not consist however, in a slavish obedience to the popular will. The specialist should not lose his individuality and be turned aside by the false views or whims of those whom he serves. It is rather his business to obtain such a knowledge of the needs of those who consult him, and rise to such a degree of individuality and firmness of character, that he may have the power to control his patients and lead them into that course and action that will best meet their needs in each individual case. Here the specialist is not only the dexterous operator, but also becomes the teacher, and must by his council and advice lead the erring into such habits of life as will best promote their physical and mental welfare, and prevent the occurrence of disease. Skill in this line of work is just as important to your future success as dexterity in manipulation.

Every young man in entering upon a profession which shall constitute his life work, is impelled to the choice by some motive more or less strong. We take it for granted that every young man has some object before him that he wishes to attain. Some will strive for wealth, and perhaps a large number start on their life work with this end in view. Others may desire fame more, and are anxious to build for themselves a name among men, believing that after this is attained a sufficiency of this world's goods will follow. Some of you may have chosen the dental profession with the idea that it will furnish you a living with less labor than other professions. And some of you may have made this choice with the idea that you possess the natural dexterity which renders you especially fitted for the delicate manipulations so much required in this specialty. So it is that some enter this profession from one motive and some from another; but all desire success, and we presume are willing to give their best efforts to secure the object sought. A firm determination of this nature is certainly to be commended in every student. After years of experience in this specialty and a fairly wide observation of men in other avocations, I may be presumed to know something of the proportionate returns for the mental and physical energies expended. The capital invested by the dentist is that which he lays up in his brains and hands. Of dollars and cents he needs but little, and that little can often be supplied by his friends. But in obtaining that store of knowledge which alone furnishes the capital that determines his success or failure, he must rely mainly upon his own industry and obtain it by patient toil. Friends may assist by placing the matter properly within his grasp, and let me say that the Faculty of this institution will devote their best energies to this work.

In my observation of men it has appeared that dentists have won for themselves as fair a share of this world's goods, when compared with the capital, knowledge and energy invested in the business, as has fallen to the lot of men in other pursuits. The dentist who is well fitted for practice, and has a fair personal address,rarely fails to make a reasonably good living. Some very well informed men fail, but it is usually to be explained by some mistake in location or equipment, but oftener from errors of personal conduct. Those who attain wealth rapidly are comparatively few in any profession, and dentistry is no exception to the general rule. Yet there are examples enough to show that the dentist may accumulate wealth with considerable rapidity; but, at the same time, it must be conceded that dentistry is not the profession for a man to chose whose principal desire is to obtain great wealth quickly. Those who enter this profession with the desire to attain great fame had about as well retire at once. But to those who wish to be known as men among men, and attain a good name in society as persons who are doing their full share for the welfare of the human race, I would say go directly forward with the course you have chosen. We want you with us, and can promise you that you will find ample room for development. Your opportunities for good will enlarge as you progress in your professional work, and an appreciative public will reward you. While dentistry may and does require of those who do their duty in its practice much hard and patient toil,and much that is discouraging at times, it has pleasant features. The dental practitioner if he manages his time wisely may have as many hours for undisturbed relaxation as the devotee of any other profession. It is rapidly becoming the custom of the members of this profession to establish their hours for office work, and have some time that they can call their own, in which they can go forward with such studies as may be desirable and pleasant, each one following his taste. Or the dentist can devote, if properly and temperately done, much time to the pleasures of society, cultivating friendships, giving and receiving visits If his tastes incline him in that direction, he can give much attention to the study of science, art and literature. Let me say also that directly in the line of his profession there is yet a rich field open to exploration and discovery. The dentist, or indeed any other medical man, be he general practitioner or specialist, need not want for fields of research for many generations to come. No field of research has been more enriched than ours during the present century, and the prospect for finding other and still more brilliant treasures in the years to come is brighter than ever before. It is entirely unnecessary that I point toward special fields that are now in sight. A sufficient number of them will rise up in the path of the earnest student, and his time may be well spent in legitimate lines of investigation that will give a rich reward to his diligence and perseverance.

In your work while here in this College, the Faculty will expect of you punctual attendance on the several lectures, and constant diligence in the Infirmary and Laboratory. You will have but little time to play during your course here. The time required of you is very short when considered with reference to the work you are expected to accomplish. Indeed many of us who have been long in this field of work feel that it is much too short, yet the work seems to be demanded within the time set apart, and it will be your duty to make the best possible use of it. In the meantime, the several members of the Faculty will do their best to excel you in their promptness and devotion to their part of the work.

GOLD FOR FILLING TEETH.

BY W. O. KULP, D. D. S., DAVENPORT, IOWA.

Read before the Iowa State Dental Society, May, 1884.

The subject of filling teeth with gold has been discussed and *cussed* for more than fifty years, in journals and in societies, by the dental chair and in private conversation, until we can well say; what more can be said, what more can learned?

In fact, this subject has a strange power of infatuation.

The student does not become so enthusiastic over any other part of his professional acquirements as when he sees his first glittering contour gold filling. He will call up the entire class, individually, and show off his triumph, and he will at once strike a cord of sympathy in the minds of all. It is not a strange thing to see a young and even an old operator so absorbed in a fine gold filling that he will not notice hunger or weariness; in short, the amount of untiring energy put forth uncomplainingly with this class of operators is simply amazing. What would become of our specialty if it were not for this stimulus? I fear it would finally sink into a sort of humdrum, don't care calling. For my own part, I believe I would hardly care to remain in the profession if I were forbidden to fill teeth with gold. But is this stimulating impetus the only reason why we advocate filling teeth with gold? I answer not by any means. After an experience reaching over twenty-five years in attempting to save teeth by filling with gold, and during that time giving due experimentation to all other materials that have been thrust before us, I must give my testimony to-day, most emphatically, in favor of gold, as being the most absolutely perfect material (with the single exception of color) yet given to the profession, as a means of restoring and preserving decayed teeth.

Let us see what is necessary in a material to be used for this purpose:

1. Purity. Not liable to affect the general health, by giving off particles of its own substance; not to be affected chemically by coming in contact with food or medicinal agents, and thus combining and giving off an injurious *element.*

2. Adaptability to the walls of the cavity so as to effectually exclude air and moisture from the cavity.

3. Imperishableness. Able to endure mechanical friction and be insoluble in the secretions of the mouth, or chemical agents taken into the mouth. Gold has all the above qualities in completeness.

4. In color of tooth structure it is a failure; still, a well finished, soft gold filling kept clean does not look badly, much better than any other durable material yet given us.

As to its electrical harmony with dentine or tooth substance, I have no sympathy with the position taken by the advocates of the new departure on this point, my experience and observation never having revealed any such condition assumed by them to have been discovered. Neither do I believe that gold and amalgam or other material when put into the same tooth and in the same cavity do any harm to each other, or the patient, or the tooth substance. I have seen a great number of such cases doing well after many years' service.

I have special reference to repairing gold fillings with amalgam. I see such cases of repairing, after over twenty years' service, still in perfect condition, even in teeth that were considered at the time of repair too frail to again be filled with gold. Our limited knowledge of chemical laws and affinities often misleads us in our attempts to weave out some finely spun theories.

Hence, years of experience do not always agree with what some fellow has spun out and published in a book or pamphlet, or said at a society meeting.

I do not want to be understood as being an advocate for using mixed materials for filling teeth, but that I would not hesitate to repair a leaky gold filling in a molar or bicuspid with amalgam.

I do not intend this paper to be understood as advocating any new method of filling teeth with gold, but it may be of interest to some of the younger members of our society to listen to a review of the different modes of using gold for filling teeth.

1. Within my personal recollection gold was folded in strips of one-fourth to one-half leaf each, and sometimes whole leaves and even two and three leaves, if the cavity was very large, and then these strips were placed in the cavity, fold after fold, until it was about three-fourths full, when the folds were packed against the walls, instead of into the bottom, leaving the gold projecting enough to condense and still leave the cavity over full. This was about as difficult a method as any since employed, but made excellent work if well done.

2. Was what is called cylinder filling, where the gold folded as before, was rolled upon a broach, until it formed various sized cylinders. These were placed upright against the walls of the cavity until they were well protected, when the wedging process began from the centre of the filling in every direction, and more compact cylinders were placed in the space so made. This process continued until no more space could be made, when the filling was condensed with burnishers and finished. Many became quite expert in this manner of operating and many fillings put in after this mode may still be seen in the teeth of old people. I removed one the other day that had done good service for over forty years.

In this operation the stickiness of the gold, as it was then termed, was a serious objection. We often allowed the filling to get wet with saliva to overcome it. How often I feel like saying "fool that I was to puzzle and sweat trying to overcome what has since been my best friend! viz., the cohesive property of gold.

3. Came the nugget plan, which consisted in squaring the walls of the cavity as much as possible, and then folding and rolling gold foil into a hard mass, just a trifle smaller than the cavity to be filled, but about one-third higher than the depth of the cavity, thoroughly driving it home, depending on the battering out of the gold to fill the entire cavity, and leave a surplus for finishing off. In this operation I used the tack hammer (quietly) long before the mallet was in use! I was ready to say, God bless you! to Dr. Atkinson when he publicly advocated it in filling teeth.

Next came the sponge and cohesive gold era. In this era more teeth were wrecked and more suffering inflicted upon humanity than before or since. Not that I would be understood to say that no good work was done with cohesive gold—not by any means, for each have living specimens of success; but as a general rule making a hard ball of gold in a cavity was done at the sacrifice of thorough adaptation to the walls of the cavity, and thus many teeth were sacrificed, and many well-meaning men cursed by suffering patients. Gradually the older practitioners found that heavy foils did not save teeth as did some of our earlier operations with non-cohesive gold and lower numbers. One by one operators went back to Nos. 4 and 6 cohesive gold foil, and finally, to-day, there is more non-cohesive gold No. 5. used by the profession than ever before. This is made into pellets,balls, blocks, and ropes, and then annealed as it is used, thus making it as cohesive as desirable, as the work progresses towards contouring. Thus the old time method of filling cavities with soft non-cohesive gold, and the later one of building out with cohesive are combined until there seems to be no further room for improvement. We will find that this era will be called the successful one, as compared with all the past. As to the future, we must expect new things, new instruments and new modes of condensing gold. We have already found the true forms to be employed. If we can only find some way to get it into the cavities without so much pounding and hammering, our patients will call us blessed. Whether we can expect much of the

Herbst method is yet to be demonstrated; while at present I cannot see its possible adaptability in all cases, I believe it to be a step in the right direction, and that the time is not far distant when new light will be revealad to some one and hammering will be comparatively obsolete. That it may soon come the profession and suffering humanity will pray and ever pray.

TRANSLATIONS.

ON THE HISTOGENY AND HISTOLOGY OF THE DENTAL ORGAN.

FROM PROGRÉS DENTAIRE.

After all that has been written by excellent French and German authors on the histology and histogeny of the dental organ, it may perhaps appear superfluous to recur again to this subject. My only purpose is to collect in a few pages all that, up to the present time, is known of the development and structure of the tooth.

It is less an original work than a simple résumé.

PART I.

ORIGIN AND FORMATION OF THE TEETH.

Of the numerous phenomena of the human body, none, perhaps, is more curious and more interesting than that which concerns the development of the tooth. Obedient to certain laws of nature this development begins about the sixth week of uterine life with a perfect regularity, and continues to complete maturity, but in a manner so secret that the most minute investigations, undertaken to discover the means by which it was accomplished, had for a long time no result. Nevertheless, to-day we have seemingly arrived at sufficiently precise ideas of the progress of this development.

The teeth are developed progressively from minute papillæ, visible at a very early period of the fœtal life, and situated in a groove lined with mucous membrane and running around the alveolar border of each jaw. In proportion as they increase in volume, the papillæ take the form of the crowns of the various classes of teeth which they are respectively destined to produce. Having reached this period of their formation, they begin to undergo dentification, at first at the cutting edges of the incisors, the points of the canines and bicuspids and the tubercles of the molars; the process is then continued over the whole surface of their crowns until it has completely enveloped them. Thus it is that, layer by layer (the new formation being enveloped by that previously formed), the entire solidification of the teeth is accomplished.

Before this process has far advanced, however, the formation of the enamel is begun, and this operation is finished even before the dental pulp has become completely dentified. At the same time,and as it were in anticipation of the loss of the temporary teeth, there is formed a secondary series of teeth, and when the former are shed, they are promptly replaced by the permanent organs. Thus, by an admirable provision of nature, the first series of teeth, intended only to supply the wants of infancy, at a period when the jaws are too small to receive organs like those of the adult, disappears, to be replaced by a series larger, denser and more numerous.

At about the fifth month of uterine life new follicles, containing the rudiments of the permanent teeth, are already situated obliquely beneath the germs of the milk teeth. Later, these follicles fall back and down, and at the same time take a vertical position. Their ossification takes place little by little during the early years of life, although they still remain for a certain period connected with the temporary teeth by means of a minute, long and slim cord. This cord, known also to the ancient odontologist, is called by Delabarre "appendix to the dental matrix," and is generally named "ter dentis." The histogenic phenomena are the same for both dentitions.

The mode of development of the teeth, as I have thus briefly explained it, is admitted by all anatomists; but a grave question has been raised, bristling not only with difficulties but with controversies, and for which various solutions have successively been proposed; it is the question of the genesis of the different tissues that enter into the composition of the tooth. I do not pretend to resolve in a definitive manner a question so important and so difficult; I will only endeavor, with the aid of recent works of the best authors (yet without desiring to enter into the field of controversy) and with the examination of a few microscopic preparations which I have prepared with this intention, to make at least a little clearer this obscure portion of the animal histogeny.

The ancient authors attached no great importance to the knowledge of the first phases of the evolution of the tooth, which is the reason that this part, so beautiful and interesting, of the anatomy of its development has remained till to-day almost unknown. Nevertheless, we should not refrain from mentioning those of the ancient anatomists who occupied themselves with this subject; the first was Eustachius, who, in 1563, noticed the disposition of the teeth in the jaw before their eruption. Nevertheless, his investigations were limited to observations on the human jaw after birth, a period at which he claimed to have discovered, by skillful dissection, the incisors, the canines and three molars of the two sides of each maxillary, in a condition partly gelatinous and partly solidfiied. He discovered also the permanent incisors and canines behind the temporary teeth.

After Eustachius, others attacked the the subject: John Hunter, Jourdain, Blake, Fox, Serres, Delabarre and others, but their investigations threw no light upon it. The Englishman, Goodsir, has the merit of formulating a theory of the development of the teeth based on observations made upon embryos of six to seven weeks; if this theory has been overthrown in our days by the works of modern histologists, yet for a long time it held its ground in opposition to all others. According to the opinions of the more recent authors, the development of the tooth begins with the formation of the dental germ. This germ is composed of three distinct parts which are, according to the order of their appearance, the adamantine or enamel organ, the dental papilla and the dental sac.

The dental papilla which appears at the bottom of the dental sac, is composed of two parts: a median or axis formed of a connective substance containing vessels and nerves; an external, called also membrane of the ivory or dentine, formed by juxtaposed cellules, covering the central portion of the papilla after the manner of an epithelium, "dental cellules". Moreover, some authors describe a limiting exterior membrane, "the preformative membrane" of Rashkow, which separates the dental papilla from the enamel organ. This is not generally admitted, for the membrane in question appears to be simply an a·tificial product.

The enamel organ forms a sort of hood whose concavity caps the top of the dental papilla, and whose convexity meets the inner face of the dental sac. It follows from this that the enamel organ is composed of three layers: an external epithelial layer which on its face presents prominences with which the vascular excrescences of the dental sac engage. These villous projections, presented by the internal surface of the dental sac, were first described by English authors, Goodsir, Huxley, Todd and Bowman, and more recently and with greater exactness by Robin and Magitot. According to them, the villosities are pointed towards the superior face of the enamel organ, and correspond to the ordinary vascular papilæ of a mucous membrane. Soon after there is developed a capillary net-work which receives the blood from the maxillary and the gum, and finally, the follicular walls disappearing, it forms vascular loops in the villosities before mentioned. Within the external layer lies the middle layer or pulp of the enamel, of a gelatinous appearance, whose internal cellules form the intermediary membrane of Hannover or matrix of the enamel; finally, there is the internal epithelial layer or enamel membrane.

The enamel organ and the dental germ are joined to the buccal epithelium by means of a prolongation called the gubernaculum dentis. Of the three parts thus forming the dental germ, that which appears first is, as we have said, the enamel organ. The mechanism of its formation is as follows:

From the eighth to the ninth week of inter-uterine life the buccal epithelium, which fills the dental grooves of the two maxillaries, is formed of three layers of cellules. Those of the first are pavimentous; those of the second, smaller and more rounded; and, finally, those of the third layer, cylindrical. At the moment of the formation of the dental germs the epithelium shows an elevation or ridge called by Kœlliker the dental crest.

At this stage the dental papilla begins to be formed, and appears as a bud, which, springing from the mucous tissue, is capped by the mucous portion of the enamel organ; we find also at this period the first traces of the dental sac, a simple condensation of connective tissue of the mucous derma around the enamel organ. At a more advacned period the cap of the enamel organ is fairly outlined. The cylindrical cellules which bounded its exterior have assumed different characteristics according as they are in contact with the sac or with the dental papilla. The former, which are the smaller, become pavimentous, and are covered with budlike prominences; the latter remain cylindrical, and constitute the enamel membrane. The rounded cells of the centre are gradually changed into a kind of mucous tissue without vessels, sown with star-shaped cellules, and form the enamel pulp. The innermost cells of this intermediary layer alone preserve their primitive character and form the intermediary membrane of Hannover. The pedicle which unites the enamel cap to the dental crest becomes then the true gubernaculum dentis. The enamel organ is therefore entirely of epithelial origin.

I have already said that the dental papilla is composed of two parts, an external and an internal; the external part is destined to produce the dentine which is developed at the expense of the cylindrical cells of its surface. These cells have spindle-shaped prolongations which are transformed into dental or Tomes' fibrils. Finally, in the midst of these fibrils, appears a homogeneous substance whose production is analogous to the intercellular or fundamental mass of the connective tissue. This intermediary substance undergoes diffuse calcification, transforming itself into a dentine or ivory. This transformation resembles greatly that of the osteoid tissue, so that we may say that there exists between them bonds of relationship. The walls of the dental canaliculi are formed at the expense of the layers of fundamental substance, and limit and envelop the fibrils of Tomes. The progress of this development is very difficult to follow. I will, however, endeavor to state all that in the present state of the science appears to me positive. According to Lent and other observers, the cellules of the dentine throw out little by little the filliform prolongations we have previously mentioned, and which attain a considerable length; these prolongations finally anastomose by means of their branches, preparing thus the way for the dental canalculi. Ordinarily each cell has but one prolongation, yet some of them have two. The calcification of which we have spoken above begins at the summit of the germ of the dentine, in the form of one or of several thin plates, separate, and known as the dentinal cap. This calcified layer covers, little by little, the germ of the dentine, spreading over its sides, from above downwards, and from within outwards.

At the time when this calcification is beginning, the vascular network, which is found at the centre or axis of the dental papilla, attains its entire development. At the same time, the cellules of the dentine, situated beneath its summit, undergo the changes experienced by their predecessors; that is to say, they become transformed into Tomes' fibrils with the dental canalculi and the fundamental substance. This latter soon undergoes a new calcification, from which it results that the germ of the dentine, always smaller. is extended gradually in length. This extension of the germ of the dentine gives rise to successive formations of the root, which undergoes at all points changes identical with those of the crown, changing into dentine and becoming calcified at the periphery. From this it follows that the portion of the dental papilla which is not transformed into dentine, constitutes the dental pulp.

After the appearance of the dentine, each disk of dentine is covered with a minute cap of enamel. The production of enamel takes place between the dentine and the enamel membrane; consequently beneath this membrane, by a mechanism still obscure.

Each enamel prism seems to correspond to a cylindrical cellule of the enamel organ; these cellules are calcified from the centre to the periphery, and the transformed cellules are replaced by new cylindrical cellules proceeding from the intermediary membrane of Hannover-cellules destined to calcify in their turn. The deposits of the layers of enamel are made then from the interior to the exterior ; consequently, in a contrary direction to the deposits of ivory. The pulp of the enamel insensibly disappears and the external membrane of the enamel organ constitutes the enamel cuticle.

The cement which covers the root of the tooth is formed, as are the periosteal deposits of the bones, at the expense of the internal wall of the sac which becomes the alveolo-dental periosteum. The production of the cement precedes but slightly the eruption of the teeth. In confirmation of what I have said of the origin and the formation of the teeth, I think it useful to reproduce here the conclusions to which Legros and Magitot arrived some years ago.

1. The first trace of the dental follicles appears in the form of a cord, arising from the epithelial layer of the mucous membrane of the gum.

2. The cord which gives origin to the follicles of the first dentition springs directly from prolongation of the buccal epithelium. The cord of the permanent teeth which succeeds the former is a diverticulum from the primitive cord. As for the follicles of those permanent teeth that are not preceded by corresponding temporary teeth, they spring either from the mucous membrane or from the cord of the preceding molar, according to the kind of tooth.

3. Whatever its point of origin, the cord is invariably epithelial; it is composed at the periphery, of the prismatic elements of the layer of Malpighi (the rete mucosum), and of the polyhedric epithelial cells at the centre.

4. The extremity of the cord, which soon takes the bud-like form, constitutes the organ of the future follicle.

5. The dental bulb appears spontaneously in the midst of the embryonal tissue, and covers directly the curve of the epithelial cord.

6. The enamel organ and the bulb cover and model themselves one upon another; the first serving as cap for the second, relations which are found at all periods of their evolution which precede the appearance of the dentine and of the enamel; that is to say, of the future crown.

7. The follicular wall is the direct emanation from the bulb, from which it detaches itself to rise on the sides as far as the summit of the follicle, where, joining itself again to the wall, it constitutes the follicular sac.

8. The rupture of the epithelial cord corresponds to the closure of the follicle, and from this moment the follicle loses all connection with the mucous membrane. The follicular formation is then free.

9. The evolutional phenomena of the follicles, to whichever dentition they belong, are identical in their nature. The only differences that exist are at the exact point of the origin of the epithelial cord, and in the time which the successive phases of their evolution require for the accomplishment.

10. The mode of genesis of the follicle of the tooth and that of the hair-producing follicle are identical.

ERUPTION OF THE TEMPORARY TEETH.

When the crown of the tooth is completely formed and covered with enamel (which is the condition of things at birth) and when the root which is growing longer touches the bottom of the alveolus, the tooth, which is arrested by this impassable barrier, is necessarily carried slowly and by degrees towards the gum, by the fact of its natural growth.

The most diverse opinions have been given on the mechanism of the eruption of the teeth. Some authors attribute it to the lengthening of the root; others to the pressure of the alveolus upon the root, driving the tooth towards the gum; others to a mechanical action of the crown which destroys the tissues lying beneath it. Finally the elder Delabarre compares the eruption of the tooth to the birth of a child. According to him, it is the dental sac adherent to the gum at one portion and to the neck of the tooth at another which, by its contraction, is the principal agent of the sortie of the tooth across the dilated orifice of the sac.

In the face of such hypothesis, I will only say, with the majority of physiologists, that the principal cause of the eruption of the teeth is solely the gradual pressure which the completely developed tooth exercises on the enamel organ and on the summit of the follicle, which soon give way, as well as the portion of the gum that covers them. As to the order of the appearance of the teeth beyond the gum, although no rule can be stated which will always hold good, I will nevertheless give a rough statement thereof.

According to many authors, the milk teeth erupt in groups and in a pretty regular order, the first comprising the two inferior central incisors, the second the superior incisors—the centrals first, then the laterals; therefore, when a child has six teeth, he has four above and two below. A third group comprises the two inferior lateral incisors and the four first molars. A fourth, the four cuspids or canines, and finally a fifth group, the four second molars. This order must not be considered as absolute, for there are many exceptions. The superior central incisors, for instance, may appear first, and sometimes their eruption takes place at the same time with that of the inferior incisors; at other times, the evolution of the first molars precedes that of the superior incisors. But these exceptions are rare, and the order of eruption given above may be regarded as the rule. As for the period when the eruption of teeth occurs, it is difficult to place it with any accuracy. Children are sometimes born with teeth, while others do not get their first tooth till about the twentieth month or even later. Between these two extremes, there are found every variety of intermediate epochs. In a general way, it may be said that the first tooth appears about the seventh month of the infantile life.

LOSS OF THE TEMPORARY AND ERUPTION OF THE PERMANENT TEETH.

At the epoch of the .complete evolution of the temporary teeth, the permanent teeth which are to replace them already exist in the jaws. They are arranged in a manner sufficiently regular, but different, according to the kind of teeth. If we examine at the the proper time a young jaw, there will be noticed behind each temporary incisor and canine, a minute point to which the name, *iter dentis*, has been given, because it indicates the spot from which will issue the permanent tooth. This point is the termination of the fibrous and vascular cord (*gubernaculum dentis*) which joins the follicular envelope of the permanent tooth to the neck of the corresponding temporary tooth. The *iter dentis* exists also for the permanent bicuspids, which are to replace the temporary molars, but is placed beneath the crown and between their roots.

As for the *gubernaculum dentis*, it is made to play an important *role*, it being regarded as the principal agent which guides the tooth during its process of eruption. The fact is true, but the diverse explanations which have been given seem to us far from conclusive. The gubernaculum, indeed, gives the tooth its direction, but not by drawing it as would a cord which contracts upon itself, or indeed by its dilation affording the tooth a passage as some authors have thought. According to a distinguished author, it acts by yielding its place in proportion as it fulfills its absorbent function, and perishes by a sort of self-destruction. In fact, we have seen in our account of the first dentition, that this cord (gubernaculum) was only the prolongation of the dental follicle, and that it was metamorphosed into an absorbing body (fungus of Delabarre), destined to open a passage to the erupting tooth. The same is the case for the second dentition. This fungus, which is still more voluminous, destroys little by little, as it forms, the parts in its neighborhood and, among others, the alveolus and the root of the corresponding tooth, thus making a place for the tooth beneath the fungus. The alveolo-dental periosteum, as well as the pulp of the temporary tooth, which is about to fall, become themselves parts of the absorbent body, and the root disappears, leaving its crown all ready to be detached.

Notwithstanding the authority of such authors as Delabarre, Fox and Bell, who have supported this opinion, I believe there is no necessity for the fungus of Delabarre to explain the mechanism of the loss of the temporary teeth and the coming of permanent ones.

The germs of the permanent teeth are, as I have already said, situated behind those of the milk teeth, and make their appearance the third month of uterine life. As the germs increase in size, they compress the vessels and nerves of the milk teeth, and, thus arresting their development, finally lift them and force them from their sockets.

Such, it seems to me, is the mechanism of the eruption of the permanent and the loss of the temporary teeth in their normal state. But it may happen that the germ of the permanent tooth is not situated where it should be, which we have previously pointed out; then the pressure by the coming tooth upon the milk tooth does not take place, and the two teeth exist the at same time in the jaw. In this manner are produced irregularities, and sometimes even a double denture, with a deformity more or less pronounced.

The teeth of the second dentition,properly so-called (the molars), erupt exactly in the same manner as those of the first dentition. The shedding of the temporary, as a rule, follows the exact order of their eruption. When the teeth of one group have been shed, there is allowed time enough, before the loss of another group, for the corresponding permanent teeth to take their positions. The eruption of the teeth of the second dentition begins almost always about the sixth or seventh year and is completed at from the twenty-second to the twenty-fifth year.

[TO BE CONTINUED.]

SELECTIONS.

CAUSES OF DISCOLORATION IN GOLD FILLINGS IN TEETH.

BY WILLIAM HERBERT ROLLINS, D. D. S.

As pure gold is not supposed to discolor, the causes must be other substances which may be introduced in one or more of several ways: they may be present in or on the gold foil when received from the makers; they may be present in the mouth itself.

The best way to begin the investigation was evidently to collect the discolored portions of fillings and analyze them. As yet no satisfactory result has been reached in this way, because the quantities were too minute.

The fillings themselves were next examined. Iron, silver, tin, and mercury were found. In which of the ways mentioned did these metals get into the fillings? The first attempts made to answer this question were to get samples of gold foil from the prominent makers, number them, and send them to Dr. Hills, of the Harvard Medical School, to be analyzed. The results of these analyses showed that none of the samples were pure. This was unexpected, as the makers guarantee their foils to be one thousand fine, or absolutely pure. Silver was found in every sample and iron in some. Extensive analyses made by the same chemist a year later showed the same results. The gold prepared by R. S. Williams always contained the least impurities. As the gold when received from the makers was always found impure, a short description of the manufacture may be of value as showing how impurities may be introduced.

The gold out of which foil is made is the mint gold, containing about two parts in a thousand of impurities. The makers dissolve this in aqua regia, filter, precipitate with ferrous sulphate, or more rarely with oxalic acid, wash the precipitate, melt it, and after casting, roll to ribbons between steel cylinders. It is then beaten to the required thickness between pieces of glued skin, which are never clean.

Gold in this form I shall call plain foil, to distinguish it from the forms in use. Plain foil is not in the market. It must be obtained by special order. To get this plain foil into the numerous varieties required by those who fill teeth, it passes through several processes and then becomes soft gold, cohesive gold, gold cylinders, gold blocks, gold pellets, etc., etc.; indeed one maker advertises over fifty varieties.

Cohesive Gold. Plain foil is heated (usually on an iron plate).

Soft Gold. I am not sure how this is made, as makers of foil have their secrets, but as surface impurities have been found on this kind of foil it is probable that, in some cases, the softness is due to those impurities which prevent two surfaces of this gold from uniting, and thus produce the so-called softness.

Corrugated Foil. Alternate sheets of gold and thin paper are made into a pile, placed between two pieces of iron and heated in a furnace till the paper is consumed. The sheets of gold are then separated, the ash of the paper removed as much as possible, after which the leaves are placed in books, or used in the manufacture of gold blocks, gold cylinders, gold ribbons, etc., etc.

Gold Blocks, Gold Cylinders, etc. These are the forms of gold in most general use. To make them the foil (usually the corrugated kind) is subjected to various rolling, pressing, and cutting processes by iron machinery.

This brief description of the manner of making gold for dental use enables us to see how easily impurities may be present in the finished product.

Silver, which is always present in the gold before refining, is almost sure to be present after the process, through careless manipulation and poor acids. Iron is likely to be introduced from the ferrous sulphate, from the mould, from the steel rollers, from the plates on which the gold is heated,from the hands,from the machinery used to form it into pellets, cylinders, etc. Other impurities are almost certain to come from the skins used in beating, from the paper used in corrugating, and from the dust of the shop.

To test whether impurities could be introduced by a careful person in making fillings, the following experiments were tried. The foil used was plain foil, and contained no impurities except a small amount of silver, as shown by a very careful analysis by Dr. Hills:—

First experiment. The foil was prepared in the ordinary way, as follows: It was cut with steel scissors, heated on iron, handled with steel tweezers, condensed with serrated steel pluggers, burnished with a steel burnisher. Dr. Hill's analysis showed that iron was present in these fillings.

Second experiment. The same foil was treated as before, only iridium instruments, made by the American Iridium Company of Cincinnati, were used instead of steel. Iron was found in these fillings.

Third experiment. The same foil was cut with bamboo, handled with gold tweezers, heated on platinum and condensed with iridium points, and burnished with an agate burnisher. No iron was found in these fillings.

This brief description can give no idea of the amount of care and time which has been spent on these investigations. I give a short abstract from one of Hill's reports, but even this conveys no adequate idea of the amount of delicate work in the analyses:—

"It is proper that I should state that great pains have been taken in the analyses to arrive at correct results. In the beginning great difficulty was experienced in obtaining chemicals of the requisite purity, and it was only after considerable time and trouble that acids absolutely pure were secured. In order to make certain that, if any of the metals tested for were found, they were contained in the gold itself, blank analyses were made before each analysis of the gold, using the same apparatus and chemicals."

Thus far the only metals whose presence we have accounted for are iron and silver. The next question which arises is, How came the tin and mercury in the fillings in which they were found?

Almost every dentist now uses amalgam in greater or less quantity. This remains on the instruments in minute amounts, often invisible; and when, by accident or otherwise, the same burnishers perhaps are used in making a gold filling, a little of the amalgam gets upon the surface, showing itself after a time as a discolored filling. That this is a frequent cause of discoloration I have no doubt, and only by performing all amalgam operations in another room with an entirely separate set of instruments can we hope to get rid of the trouble As an illustration, I should like to mention the following case: An amalgam filling had been made in the morning, the hands carefully washed, and other fillings of gold made before lunch. In the afternoon a large gold filling had been almost completed, but needed a little burnishing. The gold burnisher was moistened with soap and applied to the filling, which directly changed color. An examination of the burnisher showed the same trouble. For a long time I was unable to account for the mischief. At last it was traced to the soap, to which a little of the amalgam must have clung when the hands were washed in the morning after using the amalgam.

In the beginning of the paper three ways were suggested in which impurities might get into gold fillings. I have shown that in the first and second of these ways impurities are introduced, and with regard to the third way the following may be said: Certain medicines, as iron, when allowed to remain in contact with the teeth, cause a discoloration of the debris which collects about the fillings and on their surfaces. In the mouths of those who smoke, the deposits of epithelial cells mixed with lime and germs which collect about imperfectly cleaned fillings become darkened. This discoloration makes fillings in some cases almost black. Discolored fillings are due to many different causes, as I have shown. In conclusion, the following suggestions, if faithfully carried out, will do away with some of these causes:—

Demand purer gold from the makers. Use this in the form of plain foil, because this is least liable to contamination.

Never touch gold foil with steel instruments of any kind. If it is necessary to heat the gold, do this on platinum.

Keep a separate set of instruments for amalgam. Insist upon a thorough cleaning of the mouth every time food or medicines are taken.—*Boston Med. and Surg. Journal.*

DENTAL SOCIETIES.

AMERICAN DENTAL ASSOCIATION.

TWENTY-FOURTH ANNUAL MEETING AT SARATOGA.

Reported for the ARCHIVES OF DENTISTRY by Prof. Chas. Mayr.

(Continued from page 422.)

WEDNESDAY, AUGUST 6, 1884.

MORNING SESSION.

The meeting was called to order at 10 o'clock A., M.; President Darby in the chair. The privileges of the floor were voted to Prof. Chas. Mayr, of Springfield, Mass., and to Drs. Bazin, Lovejoy, Borden and Andres, of Montreal.

The discussion of the paper by Dr. Harlan, upon Pyorrhœa Alveolaris, was declared in order.

Dr. Shepard.—Hoped that speakers would be exact in their expressions. He himself had said yesterday, "dilute sulphuric acid.'' That was inexact. He should have given the strength. He intended to have added, "in the proportion of one part of sulphuric acid to three of water."

Dr. Atkinson.— If the speaker meant one part of acid to three of water, that would be much stronger than the tincture of *aromatic* sulphuric acid.

Dr. Shepard.—I meant aromatic sulphuric acid.

Dr. Atkinson.—Then the gentleman was not exact when demanding that others should be.

Dr. Searle.—I like to ask the questions, why and what. In the first place, why do we use these various remedies? I think we have not gone deep enough into the nature of the disease. We hear it said sometimes that decalcification and caries are synonymous; also pyorrhœa and decalcification. They are both diseases of the soft tissues. The lime salts have nothing to do with them. If I have rightly studied pyorrhœa, I should declare it a disease of the pericementum. Originally it is set in action by some irritant, and that irritant may be tartar, lower organisms, or mechanical irritation but whatever may be the cause, the disease starts in the pericementum, and works itself far down between the alveolus and the cementum before it makes itself manifest at all. The disease has been operating, usually, for a long time before we notice it, and, unless we can apply our remedies to the special part affected by the disease, we might just as well throw them on the sidewalk. We all know that ptyalism and the various affections of the mucous membrane are not pyorrhœa. We know that inflammation is not the disease in question until it progresses to a certain stage. Now, where does pyorrhœa commence? We cannot define exactly at what point of the inflammation of the peridental membrane the disease commences, but probably during the stage when the pericementum itself becomes involved in the disease. To cure the disease we have to remove all foreign matter; we must go down to the point of union between healthy and diseased tissue and treat it as a disease, not as an injury. How shall we treat it? After removal of foreign matter we dress it like any other wound, as nearly antiseptically as possible; whether it is a germ disease or not I do not know, but in some cases it may be, and deserves as much an antiseptic treatment as any similar disease. The best antiseptic dressing I am acquainted with is carbolic acid, full strength, applied, as stated last night, far down to the point of union between the diseased and healthy tissue. What more can you do? The teeth cannot rest; you cannot apply a plaster as to an ulcer of the skin; in ulcers around teeth the carbolic acid itself will form a coating by coagulation, which will keep out extraneous matter. How about repeating the treatment every few days? I would say let it alone, most severely. Having once performed an operation, amputated a limb and dressed it, let it get well alone; give nature a chance; do not disturb it. Somebody spoke of the application of external friction; this, I think, is perhaps the best way of removing food, foreign substances, etc, that lodge accidentally between the alveolus and the roots of the teeth. Let your patient place the finger low down and move it up so as to compress the tissues, and then rinse the mouth with a bucketful of water.

Dr. Stockton.—It does not seem necessary to say any more about the subject, as any one who kept his ears open last evening evidently knows everything about it. One gentleman, very prominent in the profession, said it was caused by deposits, and could be cured by remedies; another said it was not caused by deposits, and could not be cured by remedies; one said a saturated solution of an acid would cure it; the other said there was no such thing as a saturated solution. I do not know any more about it than I did before coming. I thank Dr. Harlan for his paper, and hope he will give us the etiology of the disease another year.

Dr. Hunt.—Considers the disease constitutional, and thinks people and tribes, who live simply in accordance with the laws of nature have better teeth than the inhabitants of so-called civilized countries. He also considers the disease one of the symptoms of urinary troubles, not the cause.

Dr. Searle.—Cases at which I have been pegging away for five or eight years have yielded in a short time to strong carbolic acid.

Dr. Pierce.—I did not mean to say that urinary calculus was the cause of pyorrhœa, but the systemic condition which is cause for one disease is also for the other. There are cases of pus in the alveolar socket, due to local causes; these removed, the disease will subside. Pyorrhœa is hereditary in many cases; I think if inquiries are made among patients, you will hear them tell that "father and mother lost their teeth in the same way;" "all the teeth of father and mother came out without decay, all sound," etc. I do not believe in the transmission of disease, but of tendencies to it.

Dr. Watkins.—Dr. Pierce thinks the disease cannot be cured; I would like to relate a case where, I think, I cured it. It was one of the lateral incisors, elongated, pressed out of position, surrounded with pus pockets everywhere except in one small space on the labial surface; the tooth was very loose; I examined it and found a very little tartar about half way up the root; I removed this and the border of the alveolus, which was necrosed; I applied aromatic sulphuric acid, full strength. A week afterwards the patient came again, and I found that I had overlooked a small spot; I treated this in the same manner, and dismissed the patient; this was three years ago, and the tooth is now sound in its socket.

Dr. Howe.—Exhibited a few instruments; one a syringe with a fine platinum tube, the other a scaler to remove deposits by pushing or pulling, and the sides shaped so as to scrape the diseased alveolus.

Dr. Harlan.—The difference between salivary calculus and pyorrhœa are great. In the first affection the pericementum has not been detached beyond the line of deposit. In any event the salivary deposit is all around the necks of the teeth, and continuous, not broken up into islands. The pericementum cannot be lifted from the root of the tooth beyond the line of salivary deposits. Whatever may be the initiative of pyorrhœa, if mechanical, chemical, traumatic, or anything else, it has a beginning at the gingival margin, on the ligament surrounding the neck of the tooth. It is believed, in connection with this injury, that micro-organisms of a peculiar form are found; that they manufacture a soluble ferment, which destroys the tissues in advance. If that theory be correct it is necessary that a remedy to destroy these micro-organisms should be injected. The reason for the frequent injection is, that the remedy you use may destroy the developing organisms, but not destroy the spores, so that in three or four days it would be necessary to repeat the injection and so on, until all spores have been destroyed. Dr. Black, of Jacksonville, has advocated this theory. It is no wonder that Dr. Pierce comes to the conclusion that the disease is not curable if he uses only one remedy which, as he himself says, cannot be applied in all cases. I have received hundreds of letters from all over the United States; I have visited the colleges, and their officers have told me they were trying the treatment I recommended. They have asked me to see the patients, and when I asked for the remedies and instruments to show how to manipulate the one and to use the others, they did not have them: How can a gentleman expect to accomplish anything unless he himself will faithfully try and be honest? It is no criticism against a method or treatment, if the criticizer himself does not practice or attempt to practice what is advocated.

Dr. Brown.—There seems to be two grounds taken in this discussion; the one that pyorrhœa can be cured, the other that it cannot. Now, let us take an intermediate ground. Who would think to condemn a physician because, when he cured a sore throat, it recurs in a year, nor, if any one had cured pyorrhœa alveolaris, and the disease reappeared in three or four years; the dentist takes generations of treatment to cure disease and eradicate it? The child says, "mother's teeth dropped out and sister's did; I come to you fearing the disease." The question is not whether it can be cured permanently. Dr. Harlan is right; he has cured cases; so have I, and so have we all; but can one tell what the cases will be five years hence? Many will recur. Does a man allow his wooden house to burn down because it caught fire three or four times, while his neighbor's stone house even burned?

Dr. Shepard.—From my observations I think the disease can be wiped out in the first generation. Taken in the incipient stages it is as curable as any disease; there will be no loss of the alveolar processes. Patients should bring their children to us in early life; the tendencies, as Dr. Pierce said, are hereditary. We need to watch them. The term pyorrhœa, meaning originally pus-flow, is used to mean the loss of tissue and the ensuing inflammation. The section of nomenclature has not been active in the proper direction.

Dr. Atkinson.—We have heard a great deal of good sense and of nonsense; some have classified diseases in the plural before they have defined them in the singular, and they have got so tangled in perception that we have had a hodge-podge of brilliant perceptions so intermingled as to be made worthless. Let us get our minds to the point of what a disease is, and how it acts, and whether it is capable of being limited or annihilated. There is such a thing as antidoting diseased activity which is the result of the introduction of foreign elements into the functioning body. Every phlegmonous abscess is self-limiting and self-curing. It will go in the direction of least resistance. If the flow of pabulum by pressure is prevented, it will abort. Why does not pyorrhœa alveolaris heal? It is the introduction of micro-organisms which float in the air that set up a ferment adverse to the formation of tissues, so that they can be built after the type of the tissue. I cured a case of twenty-four years standing in eight days. I then used wood creasote. What is recurrence? It is either repetition or imbecility on the part of the investigator, or malevolence by persisting in a wrong position. These cases of which we speak as recurrences are simply territories only inclosed a little, but not healed, in which the bacteria had sufficient oxygen to keep them alive, and they broke down the tissue, until it made its way by the recuperative law and broke through on to the surface or took another way of curing, which is encystment, whereby the foreign body becomes a mineral in its function, like a bullet in the body, remaining encysted for years. I have in my own person a splinter of wood that has become resorbed so much that I find it only occasionally. When you have removed the body inimical to the organization, that organization alone does the cure. Anything may be according to organization, a food, a poison, or a remedy. On motion the subject was passed.

[TO BE CONTINUED.]

BIBLIOGRAPHIC.

THE FORMATION OF POISONS BY MICRO-ORGANISMS. By G. V. Black, M. D., D. D. S. Philadelphia: P. Blakiston, Son & Co. 1884.

This work is devoted to an argument in favor of the germ theory of disease. It is arranged in the form of lectures, seven in number to which is added an appendix.

The first lecture comprises a brief history of the subject under consideration, and the discussion of the views of the earlier writers upon it.

The second lecture opens with a review of the theory put forth by Dr. Bastian relative to the de novo origin of life. This theory is remotely related to the germ theory of disease, but is sufficiently so to entitle it to notice, and for that reason it is considered in this work.

Dr. Bastian holds that the molecular movement theory, by being continued under favorable conditions, actually produces the living forms found in the culture fluids of Pasteur and other recent experimentalists. (This view is pretty generally disputed by other scientists, and, although a very large majority deny the correctness of Dr. Bastian's views the question still remains undetermined.—EDITOR.) The main subject is again resumed and the views of Schw ann, Latour, Pasteur, Lister, Billroth, Klebs, Virchow and others explained. In the third lecture the peculiar views of Dr. Beale are considered, followed by those of Koch and others, all of which leads our author to the conclusion that "All the foregoing taken together, gives strong presumptive evidence that all contagious and infectious diseases are produced by disease germs."

The fourth lecture considers "The Relation of Micro-Organisms to the Production of Disease." In the treatment of this branch of the subject the following propositions are presented "as a basis for a further study of the subject."

First, Experiment has shown there are many micro-organisms which do not produce disease; and that there are certain other micro-organisms that do induce disease when introduced into the bodies of men or animals.

Second, That poisons have originated in connection with these disease-producing organisms.

Third, That these poisons seem to be a product of the organisms and may be separated from them; and when so separated produce direct poisoning.

Fourth, "This poisoning is different from the disease induced by the organisms in that it is direct, and comparatively immediate, while infectious disease arises only after a more or less definite stage of incubation." And

Fifth, That probably "infectious disease is caused by a micro-organism that is capable of developing in the tissues, or blood, and forming poisons through changes wrought in the molecular forms of matter, by virtue of its vital energies; or, the physiological processes of digestion, nutrition and the formation of waste products."

Having shown the fact that micro-organisms are regularly connected with certain processes of disease and that these processes do not occur without their presence, this branch of the subject is disposed of as follows: "The Germ Theory of Disease, as it stands to-day, is essentially a mass of unexplained facts, developed by direct experiments of the most subtle nature; so subtle, indeed, that there are but few men who have the natural endowments necessary to verify them.

Then follows a brief discussion of the subject of digestion, including absorption, nutrition and the formation of waste products.

The action of ferments is carried forward to the assimilation of nutrition by the tissues themselves.

In the fifth lecture the same subject is continued under the heads of Resorptive Digestion, Digestion of Blood-clot, Digestion of ligatures, of sponge, etc.

In the Sixth lecture, Waste Products are considered with reference to the germ theory of disease, and in the Seventh, Poisons and the manner in which low organisms produce disease.

The Appendix is devoted to the consideration of Dental Caries and Its Relation to the Germ Theory of Disease.

Our space forbids little more than a simple enumeration of the chief topics treated of in this notable volume. That it offers much food for thought is but a tame expression of the value of its contents. The book is a continuous argument and must be read by all who desire to gain an intelligent perception of the views put forth, and of the testimony adduced in their support.

EDITORIAL.

The translation of the article from *Le Progres Dentaire*, Part I. of which is presented in this issue of the ARCHIVES on "The Histogeny and Histology of the Dental Organ" is by Professor Chandler, of Boston, whose previous work in this direction has hardly received the recognition from the profession which its merit demands. The addition of his name to the corps under whose management the ARCHIVES will be conducted,under the new regimé, is a guarantee to our readers that they will from time to time be presented with translations from the French and German of whatever is most valuable in our contemporary professional literature. The author of the paper under consideration makes, as will be seen, little claim for originality, As a resumé of all that is known upon this subject in England, and upon the Continent, its appearance here is at a very opportune time. Our readers will be able to compare it with the recent contributions to the literature of this subject by our American writers. The absence of illustration, so essential in work of this kind, makes necessary some familiarity with the subject in order to fully appreciate the value of the paper. As a mass presentation, it could hardly be expected that the author would enter into minute details at any very considerable length, but the salient features are, nevertheless, very clearly brought out.

There are several points in the paper not altogether in harmony with what we believe has recently been very clearly demonstrated by our American writers upon this subject. The author speaks of the teeth in the opening of his paper as developed progressively from minute papillæ situated in a groove lined with mucous membrane. It has been shown that the teeth are developed in a closed sac situated *beneath* the mucous membrane and, after the breaking up of the epithelial cord, the *gubernaculum dentis* of the author, which occurs in the early stages of development. According to the most recent observations, this sac, inclosing the developing tooth-germ, has no direct connection with the mucous membrane, until just previous to the eruption of the tooth, or about the time of the completion of the formation of the cementum, when the pericementum becomes united to, or continuous with the gum tissue surrounding the tooth. The author does not seem to have very clear ideas of the process of absorption of the roots of the temporary teeth. Upon this point we think the recent contributions of Professor Abbott and Dr. Williams much clearer and more satisfactory. There are other points, of which mention may be made, as the origin of the *persistent capsule* of Nasmyth, and the termination of the nerve fibers of the pulp, which are open to criticism, but, on the whole, the paper is well worth careful perusal. The latter points are contained in Part II of the article which will appear in the December number.

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ORIGINAL ARTICLES.

"Of all the arts in which the wise excel,
Nature's chief masterpiece is writing well."

A SYSTEM OF TREATMENT FOR EXPOSED PULPS.

BY A. H. BEST, M. D., L. D. S. R. C. S. I.

If there is a condition that more than another is calculated to disturb the equilibrium of a dentist's mind it is that of exposed pulps. The multiplicity of circumstances which surround these cases, and which are more often of a detrimental character than otherwise, frequently evade the grasp of the average practitioner, and failure is the almost inevitable result.

An excedingly troublesome source of misunderstanding, which in large measure contributes to such failures, consists in the unsettled manner in which certain observations are made, conjoined with the arbitrary way in which the results are classed. It is not at all rare to find an operation rated as perfectly successful which might be more correctly characterized as the reverse. I may say in this connection that in our profession as in every other, there are a number of well-intentioned people who have a fashion of describing everything that they undertake as "a success." This peculiarity is not always to be attributed to a desire to appear of superior manipulative ability to their neighbors; there is probably in most cases an honest intention, which innocently leads to representations that are unsupported by a correct judgment as to what is and what is not success.

I have seen from time to time articles on the subject herein treated, and recall to mind such passages as the following, (I quote from memory):

"After the rubber dam was adjusted, which we invariably do in these cases, the cavity was made perfectly dry, after which we removed the carious portion of the tooth structure, leaving that portion of caries that covered the pulp intact, so as not to expose the pulp. We then took a small piece of cork, shaved thin, saturated it with carbolic acid, applied it directly over the pulp as a capping, and filled with amalgam, etc. The operation was a perfect success, the patient not having experienced the slightest pain, either during the operation or after the dam was removed."

Now I think I can unhesitatingly say that such declarations as the foregoing plainly show a deficiency of practical judgment, a lack of powers of observation, or a non-appreciation of the ends desired. It is quite probable that there is scarcely a dentist of any practical experience whatever who has not often seen a perfectly exposed pulp, causing no pain whatever, unless touched or irritated; but was the absence of hyperesthesia in such a case, evidence that the pathological condition was all that could be desired? I apprehend no one will pretend that such was the case, yet this tooth, barring the filling, is in the same condition as that one above described after the operation which was declared a perfect success.

A curious fact concerning the novel writers of the world has often claimed my attention; it is that nearly or quite one half of these writers are philosophical observers, determined investigators of abstruse social problems, while the other half possess no powers of individual observation, but are earnest and attentive students of the first half with an original manner of dealing with abstract and deduced principles. What is true in one branch of literature may be assumed to exist, more or less distinctly observable, throughout the whole, and dentistry can certainly not demonstrate any exception to this rule in her favor, considering that every science appears subject to it.

I have noted in the writings of some of our best and most successful practitioners, that they invariably leave a layer of decayed dentine over the pulp rather than expose it to the contact of foreign material. But however good this theory may appear, and no matter how flattering may be its success in the hands of an expert, it is pernicious. Either these gentlemen do not do what they recommend, or if they really do it, their ideas with reference to the decayed portion permitted to remain are such that the average practitioner cannot grasp them, for what the latter would call a layer of decayed dentine, and would therefore propose to leave over the pulp, the former would undoubtedly condemn and remove as superfluous and detrimental, while vice versa, what the former would call a layer of carious dentine, the latter would be willing to declare was absolutely healthy tooth structure, only perhaps slightly discolored. Thus we perceive that two conditions, one comparatively harmless, the other directly opposite, would be spoken of by the different operators producing them, as one and the same; and the actual difference could not become apparent unless the cases were presented for comparison.

We all know that some dentists do better work than others, and yet those below the standard are not to be hastily accused of negligence, for personal observation assures us that they are, for the most part, earnest and determined workers; that they fail despite their best efforts. But why, then, is it so? There must be some reason, and since one does with ease what the other never can do, we are constrained to admit that some inaptitude affects the judgment of the latter.

Here, then is the key to the difficulty, this inability is a matter of judgment.

Each of us we hope is an earnest worker; failures must therefore in the majority of cases, arise from a want of judgment, of just appreciation of surrounding circumstances, of adaptation ofm eans to ends.

We are thus obliged to admit that circumstances which insure success are to be recognized and allowed for as well as those which indicate a failure, were certain operations attempted. The absence of those conditions which are invariably associated with unsuccessful operations does not warrant a prediction of success, which must be founded on the presence of all those qualities that are known to promote it. The conditions to be fulfilled will of course depend (1) upon the operator, (2) the patient, (3) the particular kind of operation, and (4) surrounding or accidental influences. No fixed rule can be laid down to be unswervingly followed, so as to avoid the exercise of judgment; each case is as surely and truly a law unto itself as it is possible for it to be, and success will attend the efforts of the operator in exact ratio to his appreciation of this fundamental truth. It matters little whether the dentist is adapting an artificial denture or filling over exposed pulps to save teeth; this principle must be adhered to for only by a skilful adaptation to the particular case in hand can real satisfaction be insured.

But it is only with exposed pulps, and the condition preceding that state, as consequent on caries, that we are at present concerned. It is a natural result of the action of caries that the pulp should be left protected by but a very thin septum of dentine; this condition, described by the epithet "almost exposed" is one that does not generally attract the notice of the average operator. Hence teeth of this description, after being filled, exhibit a most tormenting degree of thermal sensibility; a cup of hot tea or a glass of ice water excites a paroxysm of unbearable pain,which is fortunately of brief duration. This pain is more severe, and the sensitiveness to slight changes of temperature more marked in proportion as the stratum of dentine between the pulp and the metallic filling is reduced. This condition leads to one of two results; that is to say, either healthy action sets up in the pulp, which protects itself by a deposit of sound dentine, or the filling gives rise to so very much irritation as to cause inflammation and finally death of the pulp. In the former case the tooth is in a comparatively good condition until otherwise affected; in the latter alveolar abscess is the invariable result, and its appearance only a matter of time.

How to insure the first result? How to decide which is sensitive dentine, likely to take on healthy action after the filling is inserted, and which is the almost exposed pulp whose thin shield will transmit thermal changes with sufficient rapidity to excite the dangerous inflammation culminating in death of the pulp? And having drawn the line between the almost exposed and the actually exposed pulp so far as the diagnosis is concerned, how do the same as regards the treatment?

Let us suppose the pulp fully exposed; what then is the nature of this exposure? Is it quite recent, or of comparatively long standing? Is the pulp healthy or diseased? If the latter, to what extent? Does it seem amenable to treatment, or has the affection precluded all possibility of a return to health? In a word, what are the conditions? What is to be done? What is the best manner of doing it, and why? All these questions, and a hundred others, are constantly being presented, or should be, to the mind of every dentist; and the success of every dental operation naturally depends upon his capability to answer them correctly, that is, upon his more or less well-balanced judgment.

"Oh! my tooth! how it aches since I had it filled!" This phrase of lamentation goes up from thousands of tea-tables throughout the land every day. The universal appeal might well induce a philanthropist to ask "why does it ache?" The cause is plain: the operator has failed to recognize and take advantage of the special circumstences of the case, in the manner calculated to insure comfort and what we call "success;" or though he recognized them, he lacked practical ability. In the meantime, how much suffering results to the patient! "How my face is swelled, and such pains as I do have in my jaw and head!" "Indeed, is it so?" says a friend, "I can sympathize with you; but what does your dentist say?" "Oh! I just had my tooth filled last week, and he says I have caught cold in it, and have neuralgia. He told me not to take cold in it, but you see I did so after all, so I suppose it's my fault."

Another class of failures that constantly occur is occasioned by not treating with proper care the vital part of the tooth filled.

I have known cases where a patient presented himself for an operation, and, after the usual preliminary conversation, took his seat in the operating chair, when the following colloquy ensued:

"This is the tooth I want to get filled"—"Oh yes, very large cavity" (says the doctor who is anxious to thoroughly impress that fact on the patient's mind); "I shouldn't wonder if the pulp is exposd; but we'll soon see." (He takes the syringe and injects a little cold water.) "What! no pain! really, I'm very much surprised; quite expected to find an exposed pulp. I will clean it out a little." (Uses his excavator; at first cautiously, then vigorously.) "Well, now! really you may congratulate yourself; the pulp is not exposed; I'm quite astonished, it is such a large cavity." He revolves in his mind the prospective fee, and says: "Well, I can fill that tooth for you immediately; did you wish it filled to-day?" Patient answers in the affirmative, but proposes to leave the matter to the better judgment of the doctor. "Since the pulp is not exposed," says that authority, "it had better be filled at once." The operation is accordingly accomplished, and for a week or so appears to have been a "success;" but clouds are hanging on the horizon, and soon there is unmistakable threatening of a storm. "My! what a pain in that tooth!" complains the luckless patient some morning at breakfast. "I could hardly sleep a wink last night on account of it. Then the tooth actually seems longer than my other teeth; it is very difficult to eat for I cannot close my teeth; and my face has begun to swell. I must away to my dentist at once." He finds his dentist "very busy but will give him a few minutes as soon as he can." The patient being a gentleman accustomed to good society, of course sits down and quietly waits until the doctor can see him. He explains his trouble to the D. D. S., who is overwhelmed with sympathy; the doctor is "very sorry, but it was a very large filling, and you have certainly taken cold in it, which has set up neuralgia." The patient hints that there may have been something wrong about the tooth that escaped observation on the first examination. But the doctor indignantly declares "that there was nothing wrong; there was no pulp exposed; and he wishes, as politely as possible, to inform his esteemed patient that he is a regular graduate of one of the oldest colleges in this country, and ought to know his business. The whole trouble is nothing but neuralgia, which will form a gum-boil, and get well," which prediction is usually verified, at least in part, i. e., the gum-boil.

Of course the very circumstance of the operator's not finding a very large cavity sensitive should have at once suggested the probable death of the pulp, a condition which could not be overlooked without entailing consequences sometimes still more disagreeable than those above described.

To many members of the dental profession these instances will seem overdrawn and exaggerated; the better class of operators will think such negligence beyond the pale of credibility; but there are those who have observed similar cases so often that the recital will have but little novelty for them. I do not wish to be understood as asserting that under all circumstances it is possible to avert unpleasant complications, such as neuralgia, or even abscess; on the contrary, these terminations are, unfortunately, sometimes unavoidable; they should, however, be the exception, and not the rule. In fact, when a tooth is properly treated by a skilled and observant practitioner, it is very rarely the case that any trouble arises. Success depends, for all that, upon so many considerations, that any lack of vigilance on the operator's part is only too likely to diminish the chances of preserving the tooth.

Actually exposed pulps may be spoken of as practically forming two classes, viz., those that can be saved, and those that cannot. The first division embraces pulps recently exposed, not inflamed, suppurating, nor sloughing; besides several cases exhibiting such symptoms as a consequence of irritation produced by extraordinary causes, combined with a vigorous constitution. The second division embraces those cases of exposure of the pulp and breaking down of the pulp chamber not comprehended in the first class; and in which absolute devitalization and extirpation appear essential to complete success, with such after treatment as the urgency of the case may demand. We will endeavor to confine our remarks to those conditions indicating conservative treatment, i. e., to the first class.

Simple cases of sensitive dentine require very simple but effecttive treatment, which contributes but little to the success of the operation as a mechanical result, but very largely to the comfort of the patient. Many operators do not attempt in any way to counteract the liability to pain from thermal changes; but others, and among these the better class of dentists, exercise every precaution for that purpose.

Some fill the bottom of the cavity with oxychloride of zinc, a most valuable material in the proper place, but inadmissible in cases of an exposed or almost exposed pulp; for while the oxychloride seems to exert a decidedly beneficial influence upon sensitive dentine in cavities, the escharotic action of the chloride of zinc appears to be exercised unchanged upon exposed pulp tissue, so as to destroy many pulps intended to be saved. For this reason, as well as on account of the pain attending the application of the oxychloride to exposed pulps or to sensitive dentine, many practitioners have entirely abandoned its use and rely solely on preparations that combine lack of conductivity with non-caustic properties.

For sensitive dentine, gutta-percha in one form or another is used with great success; but where pulps are almost or quite exposed, it is not safe to rely upon it; for the heat necessary in its manipulation, and the pressure necessary to make it cohere, are often too great for the delicate pulp-tissue, and produce the very irritation we seek to avoid.

A solution of gutta-percha in chloroform is however of great benefit in many cases in which the other forms of that material are not admissible. The delicacy with which it may be applied, even directly over exposed pulps, and its efficacy as a covering material render it a very desirable auxiliary in many cases where gentleness is as essential a feature of manipulation as thoroughness.

This solution is improved by a slight addition of "carbolic acid;" the same effect is obtainable by touching the exposed surface, after it has been made perfectly dry, with full strength solution of crystallized pure phenol, previous to coating with the solution of gutta-percha. The coagulation of soluble albumen in the animal fluids produced by this agent interposes a slight barrier between the still sensitive pulp and the gutta-percha. But even when the pulp is not exposed at all, there is still much benefit from the adoption of this course, from the sanative influence exercised by phenol upon diseased dentine.

The advantageous use of the solution of gutta percha in chloroform extends over all cases in which direct contact of a metallic filling material with exposed pulp or sensitive dentine will, it is feared, act as an irritant. In such cases a heavy and impervious coating may be easily interposed upon the floor of the cavity, and with proper precautions in the introduction of the filling material, the disagreeable results may be considered as effectually prevented. Cases of almost exposed pulp in which the injection of cold water produces intense pain, may also often be treated in a similar manner, with the advantage of comfort to the patient, and enhanced durability of the filling. It is well, after the coating of gutta percha has been applied and the chloroform has evaporated, to cap over the weaker part of the pulp-chamber with either oxyphosphate or oxychloride, mixed to the consistency of cream and gently flowed into position, being then allowed to set, without any pressure or packing.[1]

From what precedes it will appear that the solution of gutta-percha is a very valuable auxilliary, by means of which we are enabled to fill almost every kind of cavity, from a case of sensitive dentine to one of absolute exposed pulp, without incurring any grave risk.

For the treatment of sensitive dentine, a condition which, with the average practitioner, includes also that other which we have characterized as almost exposed pulp, many other methods are recommended, but all depend on preventing contact of filling and pulp-tissue, by interposing a thin stratum of some impervious material, a thin shaving of cork, a scrap of gold-beater's skin, lead foil, goose-quill, even cotton-wool, etc., all which expedients are in their way successful, but not with that kind of success which some of us would like always to see. We usually find teeth filled in this manner to appear very dark, indicating either the death of the pulp, decomposition of the protecting material, or both results at once; the filling nevertheless may remain, the tooth be moderately comfortable, though, oh! how unsightly!

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[1] 1. Since writing the above, I find these suggestions, which were based solely on practical results to be substantiated by the experiments of Dr. Miller of Berlin.

I presume all are familiar with the Weston pulp caps, and know how efficient these little contrivances are when properly used. I am free to confess they have been of great service to me, being so convenient and handy. I adopted them as soon as they came out. Before that time, I employed the same idea the only difference being that mine were made of vulcanite. The method that yielded the largest number at least expense of labor and trouble may be worthy of insertion in this place.

Take one half of a flask, fill it up even with plaster of Paris, finish off smooth, then with a small hammer drive the whole surface full of small round-headed carpet tacks. Spread over the models thus prepared a very thin layer of wax, no thicker than paper; burnish over it a sheet of lead or thick tin-foil, taking care to bring out the heads as accurately as possible; the edges of this foil are then turned up so as to be caught in the plaster. The other part of the flask being now placed in position, plaster is poured in, in the same manner as if we were flasking a set of teeth. When the plaster has set, the entire flask is placed in the boiler, and opened when warm, and the wax gently scalded out with hot water; then pack with rubber, and vulcanize in the usual manner. The supply of caps thus obtained is of a size especially useful in many cases, and the trouble of making them is not comparable with the convenience they afford. They are not applicable to every cavity, but their form admits of much alteration, a circumstance that increases the range of their adaptability.

These caps are usually applied with the concave surface toward the pulp, precautions being taken that no part of the edge of the cap rests upon the sensitive organ it is intended to protect. It is of course highly necessary to satisfy one's self of the healthy condition of the pulp before, as it were, battening down the hatchways, and leaving it to work out its own salvation, or the reverse.

It is requisite to exclude the air from the space between the cap and the pulp; to this end the concavity of the cap is filled with some paste, usually a mass of oxide of zinc mixed with phenol-(carbolic acid). In my hands better results have attended the use of a mixture of phenol and Canada balsam, equal parts, with which just enough oxide of zinc is rubbed up to form a paste of creamy consistency; the concave part of the cap is filled with this paste, and the cap applied warm; after which the tooth is filled, and when the operation is conducted with due regard to the condition of the tooth, I can safely say that a greater percentage ot pulps may be saved by this than by the former application.

I was led to employ the balsam in this manner from a knowledge of the custom of the people who live among the pine forests of our Southern States. In these regions it is seldom that any other remedy is applied to fresh cuts or wounds besides fresh turpentine. This practice is so prevalent that it is hard to find a farm house in the rural districts, that does not possess a fresh "box" cut in some neighboring pine-tree solely for use in case of accidents of this character.

Their usual manner of applying the turpentine is to stop the blood in any convenient manner, more generally, perhaps, by compression on the wound with a dry cloth; they then dip the crude turpentine from the box, spread a thick layer over the wound, and apply over the entire surface a piece of cloth, thus improvising a kind of rude sticking plaster. This plaster is usually left in position until it falls off of itself,when the wound is found entirely healed and needing no further treatment.

A consideration of this practice led me to try the same, or at least a similar remedy in some cases of exposed pulp where the pulp had been accidentally wounded and had bled a drop or so. The first cases thus treated were cleansed of the blood immediately over the pulp; the cavity was dried with warm air from a syringe; a paper cap was cut to the size requisite to cover the floor of the cavity; this cap was held in the pliers, some distance over the flame of a spirit lamp,and the solid balsam brought in contact with the upper side of the cap, so that when it melted sufficient could be received on the paper to give an even coating over the whole surface. This cap was then applied, balsam next to the pulp, exactly as if one wished to apply a bit of sticking plaster. That the cap may be adjusted in position a small pledget of cotton saturated with phenol is employed to gently press it into place; the paper at the same time becoming saturated with the preservative, adapts itself to the cavity. Any excess of balsam oozes from beneath the pad, and is rendered easily removable by the acid. The cavity is wiped out carefully with bibulous paper; it is then ready for the filling which in these extreme cases should always be one of the white cements, mixed rather thin, flowed into position, and allowed to set without packing or pressure. This filling should be permitted to remain until we feel tolerably certain that the pulp has taken on healthy action: a period which ranges in different subjects, from three weeks to three months, and sometimes longer. If no symptoms of an unfavorable character manifest themselves, the tooth is assumed to be ready for excavating the temporary stopping and inserting a metallic filling; a delicate operation, but not difficult, and giving usually very satisfactory results when properly executed.

But if the tooth is intended to receive a permanent filling at once, without this preliminary treatment, a pulp-cap must be inserted to prevent pressure upon the pulp, and save that organ from the influence of thermal changes.

In cases of sensitive dentine, as well as that condition which I have styled almost exposed pulp, there is nothing in my experience that so fully meets the requirements as this paper cap, pasted in position, as it were, by Canada balsam. Even those cavities where there is scarcely depth enough to permit any other capping and yet retain the filling, may be made comfortable by this treatment, while nothing is detracted. I believe I have tried nearly every method, with a view not only to save teeth by filling, or preserve the life of pulps, but to make teeth so treated comfortable; and I can safely say that the treatment above explained has been as universally successful as the range of possibilities seems to permit; and I measure my successes, not by days or weeks, but by years.

A METHOD OF MOUNTING A PORCELAIN-FACED CROWN.

BY A. O. HUNT, D. D. S., IOWA CITY.

Read before the Iowa State Dental Society, May 1884.

One very important part of dental technics is that of crown setting.

There are many methods of doing this, some of which are very practical and easy of accomplishment when conditions are favorable.

When roots are crowded, the surrounding parts are subject to a class of diseases that are difficult to treat unless the pulp canal can be utilized, through which to pass the various therapeutic agents to be employed.

By the usual method of attaching a crown it is necessary to remove it whenever treatment is to be resorted to. Such removal means destruction to the crown; as one well adjusted will in nearly all cases be so badly mutilated in the operation that it is much easier to make a new one than to restore an old.

Again, most of the methods are adapted to roots that are firm and after being cut off to the line of the gums, retain all their normal strength and form. It is often necessary to operate with roots whose buccal, lingual or lateral walls are disintegrated nearly or quite to the alveolar process.

The interior of the root may be coned out deeply, exposing frail and ragged edges, with the gum tissues overlying these edges.

The method I shall attempt to describe is one suited to these latter cases, i. e., roots with frail and ragged edges, with the gum tissues overlying and filling the crown end. The following method will overcome most if not all of the difficulties in the way of success, and allow the setting of a crown that is durable, and useful. To get good access to the root, first pack it with soft gutta-percha pellets, pressing the material out over the edges and building on until the gum is displaced, so that when the gutta-percha is removed a large and free opening is had through the gum, and the edges of the root are fully exposed. This packing should remain two or three days. With a thin platinum ribbon (33 gauge) form a tube, place it over the end of the root and bind with fine wire, twisted until the platinum conforms to the shape of the root.

If the edges are too frail, fill with amalgam in the following manner:

First roughen the inner side of the root or cut ledges if admissible with an engine burr. Select a broach that will enter the apical foramen. Leave this in the canal while inserting the amalgam. Restore the contour if lacking at the same time, and withdraw the broach carefully.

The channel thus formed will be a guide in drilling. Wait a day or two for the amalgam to harden; now the end of the root will present a firm face and shoulder, nearly as good as though the walls had never been destroyed.

With tube over root in place, prepare enough plaster (plaster two parts, sand or asbestos one part), and take an impression of this and adjacent teeth, seeing that the plaster fills the tube down to the root.

When the impression is removed with the band, dry thoroughly. Pour into it Babbitt metal, (Grade C), or Watts or Reese metal.

Break away the plaster and remove the platinum tube, trim away in the metal that portion that corresponds to the gum tissue, leaving a correct model of the end of the root over which to place the permanent band of gold. Fit this tightly to the model, turning a flange over the labial edge, as a rest for the porcelain face. Now prepare the following: Hollow platinum wire (No. 60), a twist drill a trifle smaller than the wire with cutting end cone shaped, so that it leaves the bottom of the drill-hole in that form.

Hard wax composed as follows: Gutta-percha one part, pure beeswax two parts, and sufficient resin to form a mass that will be hard at the temperature of the body. Platinum rolled foil (say No 45 guage, to be used as backing for the crown). Put the gold band in place over the root in the mouth, so that the flange is below the gum line.

Follow the pulp canal with the drill, securing as deep a socket as may be.

Select a suitable plain plate tooth (pins cross-wise preferred), grind to fit, resting the cervical end on the flange of the band.

Lay a piece of the platinum foil on a soft wood surface and press the tooth pins through it. Burnish the foil down to the tooth and over the approximal, cutting the cervical edges so that at the latter point the foil will be between the tooth and the flange. Adjust the tooth so prepared to its place,driving the platinum tube or wire into the drill hole, allowing it to extend to the cutting edge of the tooth. With a hot instrument (flat burnisher), melt hard wax about the tube, inside the band and on the backing of the tooth.

Arrange everything now as you would have it when finished. With plaster and sand, or asbestos, the same as before, take an impression. Should the tooth and band not draw out with it they can be removed and put in place in the impression.

Fill all with a mixture of plaster and sand. Remove the cup and trim down on the lingual side, exposing and removing all the wax. Bend the tooth pins up close to the tube, fill the tube with a piece of broom straw dipped in wet plaster.

Flow solder around these and down over the thin platinum backing until the whole is united to the band at the flange, and a good body of it on the backing. Fit a shell of gold the same grade as the band to the lingual side, resting on the band and fitting the backing closely at the approximal edges and around the tube, which should extend outside of the shell. Solder this in place and finish with files, etc., to a contour corresponding to the tooth being mounted.

Whatever of the tube projects, file off as surplus material.

Place the crown when finished in place, perfect the articulation. Remove and attach with cement (Caulk's Diamond preferred). When mixed to the consistency of cream it gives ample time for the work, and sets hard and firm. Remove the piece of broom corn and plaster from the tube; free access can thus be obtained through this channel, for treatment now or at any future time.

Fill the tube nearly to the end with cement, closing up with a gold filling.

The advantage of this method will be readily seen. It can be used on any tooth, in any part of the mouth.

In bicuspids with two roots, two tubes may be used; and the shell for the lingual side, formed over a piece of dry hickory or other hard wood or swaged over metal dies. In molars a tube may also be used for each root.

Another advantage is in having a hollow pin or wire, nearly the combined length of root and crown, firmly imbeded in cement, giving great strength with lightness. Another, the crown is easy of construction, requiring only those instruments usually found in any well appointed dental office. Still another, it is durable; and the manipulation is postive and adapted to any shape of root.

In one case where this method was employed the root was but ⅜ of an inch in length (a superior second bicuspid) and quite loose, accompanied with ulceration. So frail that any method of band crowning would have been doubtful.

By this method and with good results in treatment after seventeen months of usage, the root is firm, the crown unimpaired, and all doing the service of a good tooth.

A GAS FURNACE FOR METALLURGY.

BY WILLIAM HERBERT ROLLINS, BOSTON, MASS.

This is the second of a series which has been devised for my laboratory. I have already described a gas muffle furnace in a paper read before the Society for the Advancement of Oral Science,[1] and shall hereafter publish accounts of the others. My object is to contribute something toward banishing from the laboratory such antiquated substances as solid fuels. Gas furnaces are superior to those using solid fuel, for they are more rapid in action, and are free from dirt and smoke. With them the required temperature can be maintained at any given point for any number of hours.

FIG. 1.

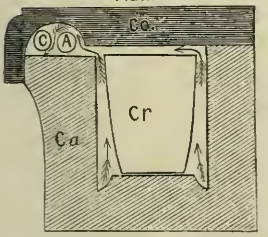
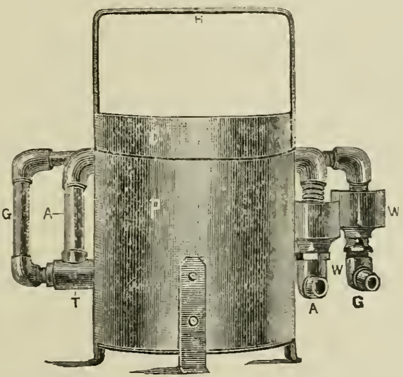


FIG. 2.



All the furnaces of this series presuppose that the laboratory is supplied with an air blast. Even for the small blow-pipe this is required, as it seems absurd to blow a fire with the mixture of carbonic acid gas and nitrogen given off from the lungs.

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[1] Published in Med. and Surg. Journal, of Boston, Oct. 23, 1884.

The furnace shown in figs. 1 and 2 is so simple that any one can construct it for himself. Indeed this is probably the only way in which it can be had, as the makers of dental supplies do not usually care to place any article on the market unless they can be pro. tected by a patent.

Fig. 1 is a section through the furnace. This consists of a pot of porous fireclay Ca with a cover Co of the same material. Between the lip of the cover and the pot is an opening through which the waste gas escapes, surrounding on its way the tubes A and G for air and gas.

Fig. 2 is from a photograph of the furnace. G is the gas tube. A is the air tube. Both are attached by rubber tubes to the gas and air mains. W-W are two cups filled with water, which prevent the tubes G and A, which are white hot under the cover C, from burning the rubber tubes where they are attached at A and G. As before mentioned the tubes, A and G pass under the cover and appear again on the other side, where the tube G enters the tube A, forming a tuyere, the mouth of which fills the opening through the wall of the furnace pot.

In these respects the furnace is simply a small blast furnace.

The gas and air remain apart till they reach the mouth of the tuyere, when they unite and, passing up on all sides of the crucible Cr. Fig. 1, go over its top and escape under the cover, passing all around the gas and air tubes which they heat white hot.

No claim is made that this furnace "will melt steel in five minutes" and any one familiar with metallurgy will see that the principles used are old. Porous fire clay was known in Strabo's time, hot gas and air burned at the mouth of a tuyere placed against an opening in the wall of a furnace have been in use in blast furnaces ever since I can remember, though T. Fletcher has recently invented them in his so-called injector furnaces, another case of adopting other men's ideas without credit.

Any ordinary illuminating gas, works well in the furnace, but the efficiency is greater if the gas is passed through naptha as described in my previous paper.

COUNTRY DOCTORS can render their shoes water-proof by soaking them in a strong solution of soap for some hours. The compound forms a fatty acid within the leather, rendering it impervious to water.

TRANSLATIONS.

ON THE HISTOGENY AND HISTOLOGY OF THE DENTAL ORGAN.

FROM PROGRÈS DENTAIRE.

[CONCLUDED FROM PAGE 517.]

PART II.

HISTOLOGY OF THE DENTAL ORGAN FROM ITS ORIGIN TO ITS COMPLETION.

Like the nails, the skin, the hair, etc., the structure of the teeth is composed of two very different substances; one represented by the tooth, properly so called, the other germinative, composed of the bulb and the alveolo-dental periosteum in the adult, and in the fœtus by the dental follicle. Of these two forms, the first, intended solely for mechanical necessities, is characterized by its color, its hardness, and by the energetic resistance it offers to physical agents.

This substance possesses neither vessels nor nerves, properly speaking. The other, on the contrary, is abundantly supplied with them; it is soft, and to it must be attributed the phenomena of sensibility which we meet with in the tooth.

In the histologic study of the tooth, we must, then, divide it, as does our subject, into two portions. In the first are comprised the hard parts, the dentine or ivory, the enamel and the cement; in the second, the soft parts, viz., the pulp or dental germ, and the periosteum or alveolo-dental membrane.

HARD PORTIONS OF THE TOOTH.

Of these three parts, the ivory or dentine is the most essential and the most important in the constitution of the tooth; it surrounds the whole dental cavity and consequently contributes to the formation of the crown, of the neck and of the root. The enamel covers that part of the dentine which corresponds to the crown and extends, continually diminishing in thickness, as far as the lower portion of the neck. The cement covers the root of the tooth, and becomes thicker as it approaches the end of the root of the tooth and thinner towards the neck, encroaching slightly on the enamel that covers the crown.

The dentine is therefore exposed at no point, and the tooth may be considered as composed of two layers closely united, one internal and thick, formed of the dentine, the other superficial, formed of the enamel and cement. Each of these substances has its own peculiar structure.

A.—IVORY OR DENTINE.—The dentine, in a fresh preparation, is a yellowish and semi-transparent substance; in a dry preparation, it is of a pearly gray. It is harder than bone or cement, but softer than enamel. The external surface of the dentine is covered, as we have seen, by the enamel on the crown, and by the cement on the root. Upon the crown it is filled with minute concave and hexagonal depressions, demonstrated first by Owen and Huxley, and destined to receive the extremities of the enamel prisms. On the root, the external surface of the dentine is uneven and rough, with inequalities filled with cement. The internal face of the dentine corresponds to the cavity of the pulp and to the dental canaliculi which derive their origin from it. This cavity, very large in the infant, a period at which the pulp is very voluminous, diminishes gradually with age. This circumstance, according to Magitot, enables us to say that in man the growth of the tooth is continuous, a growth made at the expense of the cavity, whose capacity diminishes gradually, to almost entirely disappear under the incessant production of dentine.

Considered histologically, the dentine is composed of two elements. 1. A fundamental substance; 2. Numerous canalicules which traverse this substance in a direction from the cavity of the tooth towards the enamel and cement. The fundamental substance is always homogeneous, and, even when greatly magnified, it never appears granular or fibrous. Submitted for a while to the action of hydrochloric acid, it breaks up into great fibres parallel to the direction of the canalicules, and these fibres may in their turn be decomposed into smaller fibres, thus simulating a fibrous tissue. But it may be easily seen that these fibres have an irregular form and are purely artificial. They result in fact from the disposition of the tubes which, running parallel to each other, intercept portions of dentine, to which the decalcification gives the aspect of fibres. The fundamental substance is found in various proportions in the different parts of the dentine; thus, in the external portions subjacent to the enamel and the cement, it is more abundant than in the vicinity of the dental cavity; where the canalicules are extraordinarily close. The external surface of the dentine is surrounded by a continuous layer of dark granulations quite numerous and of diverse forms.

This granular layer was taken by Retzius and J. Muller for a mass of bony corpuscles, in which the canalicules of the dentine terminated. But a close examination shows that, although the granulations are continuous with the terminal extremities of the canalicules, we should not mistake them for true bone corpuscles. According to Magitot, already cited, they should rather be regarded as minute lacunæ, hollowed in the thickness of the dentine, at its exterior limit, to facilitate communication between the tubes which furrow this tissue.

This granular layer is called by modern histologists the *anastomotic plexus* of the dentinal canalicules.

These dentinal canalicules were discovered in 1678 by Leuwenhoeck. They are microscopic tubes, hollowed in the body of the dentine,whose diameter varies, according to some, from .002 m. to .005 m., and according to others, from .002 m. to .0015 m. They open into the dental cavity by an orifice which is found in immediate contact with the surface of the pulp, and have a general direction perpendicular to the surfaces of the dentine.

The number of these canalicules is so large that their walls nearly touch. At their origin, at the surface of the pulp, they send off lateral ramifications; finally they undergo a first bifurcation, whose branches are soon subdivided many times, so that a single primitive trunk may, according to Kœllicker, give origin to as many as sixteen canalicules. These canalicules proceed then parallel with one another, but slighting waving, or in form of spirals (which are recognized by a considerable enlargement), without new bifurcations. But when they reach the external surface of the dentine, they divide anew into a multitude of minute branches which terminate in the grand anastomotic plexus, some even entering the enamel. The dentinal canalicules have their walls, easily seen in transverse sections which have been for some time subjected to the action of dilute hydrochloric acid, which at first dissolves the fundamental substance leaving the canalicules intact; these are in turn dissolved a little later, if the immersion in the acid is prolonged. Each canalicule contains a soft and transparent substance, of a viscous consistency, which is continuous with the pulp of the tooth and a dependant upon it. When dried, this substance almost completely disappears and the canalicules are filled with air; they then strongly reflect the light and appear as dark and even black lines. In longitudinal sections of dentine, we find lines curved and parallel to its general direction, more or less numerous, very unequally approaching one another which gives in them a stratified appearance; these have their explanation in the mode of development of this substance, which grows by the progressive addition of concentric layers in the direction of the dental cavity.

B.—ENAMEL.—The enamel, or vitreous substance, clothes with a smooth and shining layer the external portion of the crown. Its thickness is variable; very considerable at the triturating surface of the tooth, it gradually diminishes, to terminate at the neck in a thin and narrow border. The enamel has a milk-white color, but yet may take different shades, according to the temperament of the subject. It is diaphanous and homogeneous in character, its chemical constitution, very rich in calcareous matter, gives it a hardness which is much more resistant than either the dentine or the cement. The external face of the enamel, which is rugose, is covered by a thin amorphous pellicle discovered by Nasmyth and called by him the *persistent capsule.* This pellicle, named by Kœlliker the *enamel cuticle*, is a very thin membrane which may be separated from the enamel by means of hydrochloric acid; it is transparent and may be regarded as a means of protection for the parts lying beneath.

The enamel is composed of fibres, or prisms, of five or six faces, of a length equal to its thickness, and from .003m. to .005m. in width, planted perpendicularly upon the dentine, to which they are closely united. The enamel prisms join one another by their different faces, without fundamental substance. In the direction of their length we see portions alternately opaque and light, which gives them an appearance not unlike that shown by the striated muscular fibres.

The enamel, once developed, is subject to but a slight organic movement. Such a movement exists, says Magitot, and in fact the changes of density and of color which take place during life cannot be overlooked, nor can the fragility which the tooth acquires when it is once separated from the economy, that is to say, when it is dead.

C.—CEMENT.—The cement represents the least considerable portion of the dental organ. It is a true osseous substance. In the human tooth it covers the whole external surface of the root, beginning at the neck of the tooth by a thin border, which extends a short distance over the enamel; it gradually becomes thicker as it nears the tip of the root, where its thickness is often as great as three or four millimetres, particularly in old persons, and where there are hypertrophied masses, known as exostoses, which are frequently found in gouty patients. The cement exteriorly looks not unlike bone; it is yellowish and opaque, of a density near that of bony tissue, but inferior to that of ivory. The external face of the cement, covered with minute tuberosities, is invested by the alveolo-dental membrane, which in this case performs the office of true periosteum. Considered as to its texture, the cement presents a close analogy with the bony tissue. Like this, it is composed of a fundamental substance, and of star-shaped cavities (the osteoplastic osseous corpuscles of Robin).

The fundamental substance, deprived of its calcareous salts by means of hydrochloric acid, appears like cartilage, and by heat is converted into gelatine. The osteoplasts are more irregular and unequal than in bone, their axes are parallel to that of the root but their prolongations take for the most part a transverse direction. They are wanting for about a third of the distance from the crown; often appearing only at about the median portion of the root, and always growing more numerous in proportion to their nearness to the tip of the root. The Haversian canals are found in man only when the cement has acquired a certain thickness, at the tip of the root, and in the hypertrophied masses spoken of above. But here we are in the face of a problem, viz., do the osteoplasts of the cement communicate by their divisions with the terminal branches of the dentinal canalicules? This has been asserted by some histologists, and Kœlliker himself describes a special system of intermediary canals, intending to establish these anatomoses. Hannover denies this, declaring that the cement is separated from the dentine by a peculiar substance, *intermediary layer*, transformed from the *intermediary membrane*, which opposes this intercommunication. We will say, then, with Magitot that, without calling in the aid of this membrane, which he has proper ly rejected, it is not necessary to admit this union between the canals of the dentine and the osteoplasts of the cement, inasmuch as these two substances are too different, as well by their modes of development and of nutrition, which in the two tissues are independent.

SOFT PORTIONS OF THE TEETH.

Under this name we include the dental pulp and the alveolo-dental membrane.

A.—Dental pulp. The dental pulp of the adult is nothing but the papilla or dental germ of the fetus, except that its volume is greatly diminished by the progressive development of the tooth. It occupies the central cavity of the dentine and is prolonged into the root. The papilla takes the form of the walls of the cavity which inclose it; it is therefore spindle-shaped in the canines, while in the molars it presents a number of conical projections, equal in number to the tubercles of the crown. As has been already said, its volume which is considerable in infancy, gradually becomes less with age, and in old age it is reduced to a mere thread, which entirely disappears toward the end of a long life, when the constant production of dentine has entirely obliterated the dental cavity. The dental pulp is a soft substance, of a grayish red color, and seems at its surface to have no adherence to the dentinal wall.

Considered histologically, the dental pulp of the adult presents but slight differences from the same organ in the fetus. It is formed of a tissue slightly fibrous, with a homogeneous, amorphous substance interposed; it is finely granular and transparent, and, in its midst are found embryoplastic nodules. These nodules are smaller than those of the fetus, but their character is identical. According to Magitot there are not found in the interior of the organ in the adult the crystals of hematoidin found by him in the embryo, whilst at the surface of the pulp the cellules of the dentine form a continuous layer. Blood vessels are very numerous in the dental pulp, producing the ruddy appearance so often seen. The pulp receives as many vessels and nerves as there are roots. These vessels enter the organ, and there ramifying terminate at a short distance from its surface. According to Kœlliker, the capillaries measure from .009 mm. to 010mm. in size, and form a very close mesh from which the veins issue. The pulp seems not to be supplied with lymphatics, but is, on the other hand, richly furnished with nerve filaments. Into each root a nerve filament penetrates which measures from .07mm. to .09mm. in diameter, accompanied by several branches, six and even more, which are from .02mm. to .05mm. These branches also penetrate the pulp, there ramify and form a dense plexus which divides into primitive fibrilla, rather pale, which are hardly the .002 to .003mm. in diameter. A portion of these minute fibres end in loops (Wagner), and the rest in conical or button shaped extremities (Magitot).

As the question of the nerve endings in the dental organ are not finally determined for want of proof observations, and also on account of the great difficulties which such an investigation presents, I take the liberty of quoting the opinion of Professor Inzani of Parma who gives the mode of termination of nerves in the tooth as follows: The pale fibers surrounded by membranous tubes pass into the dentinal canals, then enter the enamel, where they terminate in a pencil of filaments swollen and luminous at their ends, where, enveloped by the nerve sheath, they form a club-shaped enlargement .018mm. in length, .006mm. in thickness at the bottom, and .002mm at its smallest portion.

The nerve filament passes into a tube between the papilla and either the dentine or the enamel, where the tube itself terminates on the dark bottom around the enlarged end.

The nerve fibres with double contours divide in the papilla or germ into pale fibres of which each forms a bundle of filaments, which, surrounded by a sheath, emerge from the papilla, dividing into numerous threads, which pass into the membranous tubes of the dentine as far as the enamel. It would seem that for the tooth as for other organs, each thread has attached numerous bundles of filaments or terminal enlargements.

B.—MEMBRANE OR DENTAL PERIOSTEUM.—The dental periosteum is a thin membrane in the alveolus interposed between the tooth and the process, and adhering closely to the cement which it covers on every part of its surface. Formed by the external envelope of the follicle, it has its origin at the neck of the tooth, often adhering strongly to the tissue of the gum, of which it seems to be only a continuation. It is this cirumstance which, in extracting, frequently causes the tearing of the gum, unless the precaution has been previously taken to separate the tooth from the soft parts. The periosteum then is directed towards the end of the root, sending out here and there fibrous attachments to the alveolar wall, until, having reached the very tip of the root, it there meets the vessels and nerves of the tooth over which it extends, forming, a sort of sheath, not, as has been thought, folding over into the dental canals and covering the surface of the pulp. These vessels are not then accompanied by the periosteum in their passage through the tooth but, on the contrary, come in direct contact with the dentine.

The structure of the alveolo-dental membrane,belongs at once to that of the mucous membrane of the gum and that of the periosteum of the bone so that we may consider it as intermediary. It is, in fact, formed of a fibrous connective tissue, without any trace of elastic fibres, permeated by a capillary net work, and by numerous nervous ramifications. The vascularity of this membrane, as well as its nervous richness, explain, in a manner that admits of no doubt, the frequent inflammations of which it is the seat, and the acute pains that accompany them. The alveolo-dental membrane may take on a great number of changes, which are still the subjects of investigation by several savants, among whom are some Italian authors of distinction. It seems that this membrane in the aged is subject to a kind of gradual hypertrophy which with other causes, brings about the physiologic loss of the dental organ.

SELECTIONS.

REPORT OF A PECULIAR CASE OF MALFORMATION OF THE JAWS, AND THE TREATMENT.[1]

BY W. W. ALLPORT, M. D., CHICAGO, ILL.

Read to the Section of Dental and Oral Surgery of the American Med. Association, May, 1884.

MR. CHAIRMAN AND GENTLEMEN.—The plaster casts I exhibit to you are models of a case that I have recently had under treatment. It had excited considerable interest and discussion among some of the surgeons and dentists of the patient's native State, but no definite treatment had been decided upon.

On taking up his residence in Chicago, the dentists at his home in New Hampshire advised that he put himself into my hands for such treatment as might be thought best, and the case is, I think, of sufficient interest to warrant me in presenting it to the Section.

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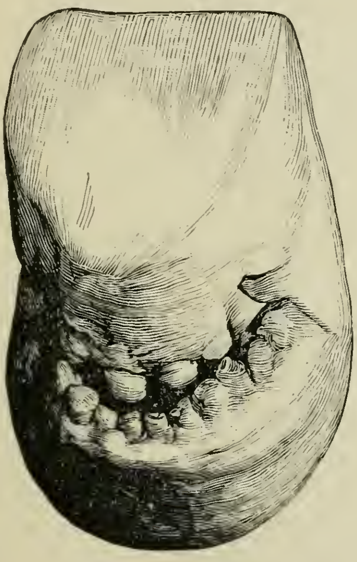
[1] We are indebted to the Journal of the American Medical Association for the loan of the cuts illustrating this article.

Mr. F. L. S——., aged 25 years, çonsulted me June 22, 1884, for a malformed condition of maxillary arches. The young gentleman is a graduate of Harvard College, and a civil engineer by profession.

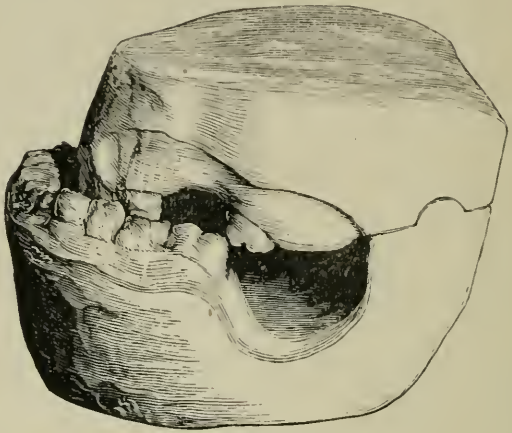
The malformation was such as to make it impossible to properly masticate his food, and his personal appearance, especially when eating, was very unsightly and a source of great mortification.

The trouble was largely due to a lack of development of the upper jaw, consequent upon a failure in the formation and development of the temporary and permanent teeth. Just how many temporary teeth were erupted I am unable to say, but from the best information gained, it is evident he did not have the full complement.

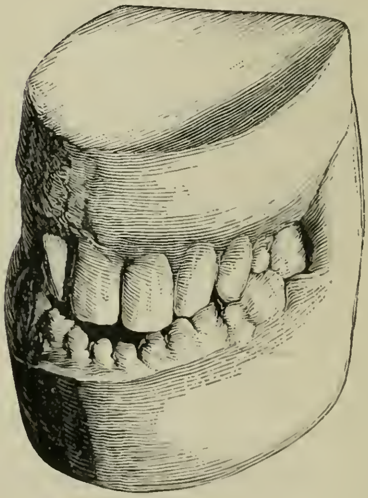


CUT NO. I.

When the examination was made there were only seven teeth in the superior jaw, two temporary cuspids, two permanent central incisors, and three molars, the first and second upon the right side and the second upon the left, all being somewhat imperfect in form, and these are the only permanent teeth that have made their appearance in this jaw. In the lower jaw the six anterior temporary teeth were still in position, though much worn away on the cutting edges (see cut No. 2), and the second temporary molars on



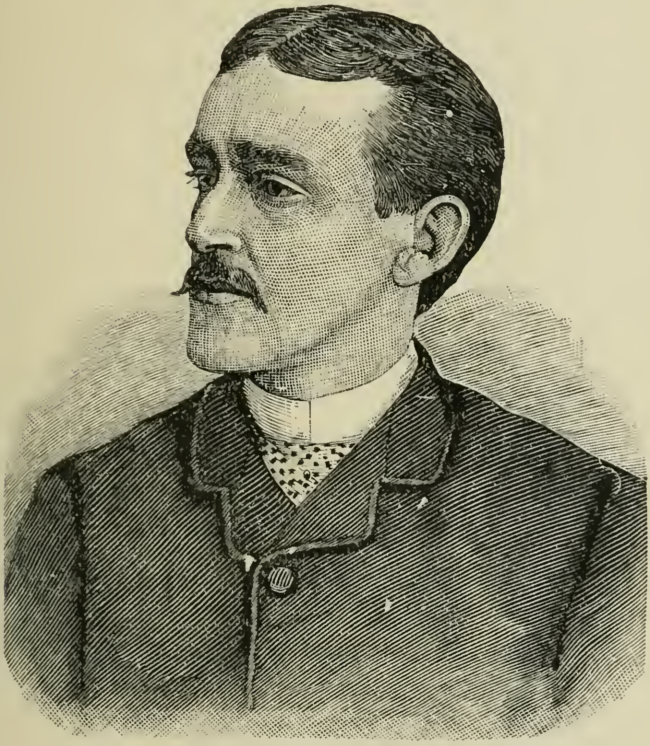
CUT NO. II.



CUT NO. III.

the left side, and both temporary molars on the right side, each considerably decayed. The permanent teeth were the first bicuspid on the left side, and the first molar on either side.

The angle of the lower jaw was less acute than normal, causing the jaw to protrude to a slight extent, but would have caused no marked deformity had the superior jaw been properly developed.



CUT NO. IV.

Cut No. 1 represents a front view of the case (taken from plaster casts) with the jaw closed to the full extent.

Cut No. 2 represents a side view of the same models, which shows the extent of the recession of the upper jaw, and the protrusion of the lower; also that the occlusion was such that when the jaws were closed "the bite" was so short as to produce a most unsightly appearance of the face.

To lengthen the bite permanently, gold crowns were fitted over the only superior molar of the left side, and the anterior of the two molars on the right side, and so shaped as to cover in their occlusion about one-third of the grinding surface of the permanent molars in the lower jaw. By this process the bite was lengthened three-fourths of an inch, as evidenced by cuts No. 3 and No. 4, which placed the jaws in a normal position. After the jaws were thus thrown apart, the four front teeth were extracted, a gold plate was fitted to the mouth, and secured by heavy clasps around the gold crowns, and then mounted with artificial teeth secured to the plate by rubber attachments as represented in cut No. 3. Cut No. 4 is taken from a photograph of the gentleman after the operation was completed.

It is a matter of regret that a photograph was not taken with the mouth closed before the jaws were permanently thrown apart by the gold crowns, that the great change in the expression might be seen and contrasted with cut No. 4. But this can readily be imagined.—*Journal of the American Medical Association.*

DENTAL SOCIETIES.

AMERICAN DENTAL ASSOCIATION.

TWENTY-FOURTH ANNUAL MEETING AT SARATOGA.

Reported for the ARCHIVES OF DENTISTRY by Prof. Chas. Mayr.

(Continued from page 525.)

WEDNESDAY EVENING SESSION.

By special vote of the society the evening session was occupied by Dr. J. L. Williams, of New Haven, Conn., who read a paper upon "The Origin of Enamel and the nature of Odontoblastic Cells." It was illustrated by a great number of very beautiful preparations, the images of which were projected upon a screen by means of the stereopticon. Owing to the necessary darkening of the hall, as well as to the absorbing beauty of the preparations which continually distracted the reporter's attention, the notes of the paper are not as full and perfect as they might otherwise have been.

The speaker commenced by criticising the expressed views of Dr. Garretson, Dr. Cryer and others, and stated that he would demonstrate they were based upon faulty preparations and imperfect knowledge.

He had presented this matter at the last meeting of the New England Dental Society, and it was then privately remarked that it was of little importance whether or not his own theory was the correct one. He differed with them, for it was impossible for one to undertake, with any hope of success, such a work as the joining together of parts of broken teeth without a definite knowledge of the nature of the process. Besides, as professional men, it is our bounden duty to obtain all the knowledge possible of the tissues upon which we operate.

It is of the greatest importance that the student should be correctly taught concerning this subject. The purpose of this paper was to point out the most important fallacies still existing concerning the structure of the teeth. For that purpose he would consider what is stated about the papilla of the pulp, and show that there is an enamel organ which has a definite structure, and that the formation of this enamel organ takes place from the dentine outward. He would show that the odontoblasts are ganglionic elements, sending branches into the dentine and the pulp. To answer the question, why this was not established before, he would say that it is very difficult to obtain specimens that show the natural relations of the dental tissues to each other and the surrounding tissues, without breaking the continuity of the structures. A great number of microscopic slides were shown, most of them photographic; a few, diagramatic.

First slide. From a professional dealer in microscopical specimens. In this you may see the appearance of what Dr. Garretson calls the utricula reflexa. All the delicate structure, the basement membrane, and the enamel organ are destroyed; this slide has some historic value, just as the implements of the stone age tells us of the progress that has been made..

Second slide. This is in contrast with the foregoing. The old views were derived from balsam-mounted specimens, which define less distinctly than those mounted in glycerine. This slide shows the first differentiation that marks the beginning of the tissues; it is perfect in every way, except at one point. The groove of which Dr. Garretson speaks is filled out with the enamel organ, which is destroyed very easily by careless preparation. The former logic in support of the theory about the formation of the enamel ran thus: The enamel is an epidermoid structure; all epidermoid structures are formed in the same manner —ergo, the enamel must be formed in same manner. This is only a trick of logic, not supported by any evidence. A vast amount of ignorance may conceal itself behind a general physical law. A little definite knowledge is better than generalizations, which may mean something sometimes, but generally do not. How a tissue which never grows after it has been destroyed, can be compared to one which is constantly thrown off and replaced by a new one, is beyond comprehension.

Third slide. Tinted a very little with carmine, beautifully shows the origin of the dental tubuli and their ends.

Fourth slide. Shows a permanent tooth, with the pulp removed and the dentine cells in some places intentionally forced away from the enamel.

Fourth slide. Shows a cut through a temporary tooth a little to one side of the center, cutting through the completely formed enamel with its hexagonally divided arrangement.

Sixth slide. Shows something like crochet work. It is possible that the enamel may be formed by intercellular deposits; of such formations we have analogies; the Placoid scales are formed in the same manner; they have spinous projections that have an enamel layer which is deposited as a cuticular deposit of the epidermis. This crochet-like looking tissue is from the embryonic shark; it looks like an embryonic tooth.

Seventh slide. Shows the cord which is drawn down at the first folding of the dental cyst,and which develops from the columnar layer of epithelium. It is already broken from its union with the upper layer, and the tooth cyst is isolated thereby; this specimen shows also the development of a beautiful reticulum of the enamel organ; I have not determined whether it is developed by direct reformation of cells or by a breaking down of embryonic tissue. After the completion of the enamel, the organ is exhausted, yet it remains on the lower side of the tooth until its work is also done there, after which it disappears.

Ninth slide. Shows an additional proof of the existence of the enamel organ; the enamel-forming cells and the reticulum are there, but the stellate cells, seen in the former specimen, are not seen. On the top of the tooth the enamel organ has disappeared, and the calcification is complete. At the sides it is not complete,and therefore it still exists there. The pericementum makes its appearance, and thus a connection of the tooth with the external world is established.

Tenth slide. You remember that on a previous slide, No. 8, at the lower end of the enamel cap, there was shown a columnar layer of cells which came, in the development of the cord, from the columnar layer of epithelium above. This is a highly magnified view of this point at a later stage. The columnar layer has disappeared, and the space is occupied by indefinite embryonal tissue or indifferent corpuscles. The reticulum of the enamel pulp, shown here, is very beautiful. The embryonal corpuscles forming the lower part of the indifferent tissue are developed from the ameloblasts or enamel-forming cells.

Eleventh slide. Shows a somewhat advanced tooth germ; the ameloblasts are above the flattened layer; above it, is also visible the reticulum of the enamel organ.

Twelfth slide. Shows the amelobasts in the form of biscuits; the analysis proves that this portion is highly impregnated with lime salts. I, said he, call your attention to the odontoblasts. You know that Dr. Heitzman and others have represented them as round corpuscles, between which the dental fibrillæ pass. I have satisfied myself that this has been an erroneous view, but it was not until within a short time that I have succeeded in cutting a section so thin, that only one layer of odontoblasts was obtained. I can show you photographs in which the dental pulp and the enamel pulp are in perfect contact, and others, where the first faint traces of dentine and enamel appear. (The photograph was here exhibited.)

This specimen I exhibited to Drs. Heitzman, Bodecker, and Atkinson; Prof. Heitzman only glanced at it when he turned to Dr. Bodecker with frankness and said: "It is evident we have made a mistake;" subsequently, he thought he could detect delicate fibres passing between the fibrils.

Thirteenth slide. You see the prolongation of the odontoblasts into the tubuli; one point shows two fibrillæ originating from the odontoblasts. I discovered that sometimes three or more fibrillæ are projecting.

Fourteenth slide. I have often been asked how I explained the formation of dentine. Do these cells perform a double function? are they the elements of sensation and of the formation of dentine? We often see a multiplicity of functions performed by embryonal cells. The odontoblasts are essentially neural matter and are probably also the secretive elements of the dentine. Some species of molluscs show similar cells in the digestive tract, and they are exhibited in the photographic slide, thus proving their multiplicity of function. I trust that this addition will prove of benefit to all. I have sometimes spoken a little sharply, because I would not like to see the results of the study of years set aside by a hasty examination of inferior specimens and sections.

At the close of the very instructive and interesting address of Dr. Williams, Dr. J. H. McKellops asked the suspension of the order of business that an announcement might be made. Leave being granted, he called upon Dr. W. C. Barrett, who aroused the sympathy of every member by relating, in a touching manner, the particulars of a very painful accident that had just occurred. The little motherless boy of Dr. W. R. Clifton, of Texas, was, in company with his aunt, crossing the street, when a carriage, driven at a reckless speed, ran over him, crushing the skull and breaking a number of bones. The sympathy of the Association was tendered Dr. Clifton, and the executive committee was, by vote, directed to engage physicians and nurses, and to take measures to bring the criminally reckless driver to justice.

Dr. Atkinson.—Desired to express his obligation to the writer of the paper, and had commenced a consideration of some of its points when he was interrupted by Dr. C. W. Spalding, who said that he had been so shocked by the relation of the terrible accident that he was in no mood for a discussion, and he thought others were in the same state. He therefore asked the speaker in possession of the floor to give way for a motion of adjournment.

Dr. Atkinson.—Said that he was astonished at the puerility of the excuse for adjournment. We were never more clearly in the way of right than when we were pursuing the path of duty and earnestly laboring at the business directly before us. He declined to give way and continued his remarks, but the sentiment of the meeting was evidently against him, and the members left in such numbers that an adjournment for want of a quorum was soon a necessity. The painful accident seriously interfered with the consideration of the paper.

WEDNESDAY MORNING SESSION.

Prof. Chas. Mayr.—Almost all differences in the different views about caries seems to come from an indefiniteness of what and where the caries really is. If a patient comes to you with an aching tooth, is the ache the caries? Certainly not. Or the tooth?—again not. Or the plug you dig out? Not at all! But while you begin to dig the patient first feels nothing, then he becomes nervous and complaining, as you reach a certain point, which irritability again disappears, when you come into healthy dentine. The "caries" comprises therefore only that small diseased layer, probably not over $\frac{1}{100}$ of an inch thick,which was sensitive; outside we have the worthless plug or corpse of the tooth substance; inside, the healthy tooth. Dr. Miller seems to have mostly examined the corpse, and produced the corpse,but not enough of that extremely small border line. In an abscess,the pus is not the seatof the disease, nor the inflamed tissue underneath, but that small layer of tissue where the physiological—or, if some fogies like the word better, pathological—processes are going on, and the study of this layer will enlighten us about the abscess, but neither the pus or the inflamed tissue underneath will tell us much.

Dr. Atkinson.[1]—What is a process? It is a going on of something. What is a thing; a thing is a think. Pathology is only perverted physiology. The function of building a tooth is its evolution, the decay, decadence, its downfall. Thanks to Carl Heitzman and to the angel that squeezed him from Rokitansky's laboratory and sent him over to us, the most ignorant may work now as intelligently as such angel. The typal order of the enamel is a modification of that of the dentine. The enamel is really a living tissue as shown by the presence of protoplastic strings between the enamel rods. The bacteria are not found in the basis substance but in the tubuli of the dentine, going towards the pulp. There are bodies that we have not seen with the highest power of amplication and concentration of light, we may call them ghosts, the ghost of the bacterium is there, before the bacterium can begin, but when we can color them we only deal with the tracks of ghosts; but the tracks would not feed of us we want to have a ghost for dinner.

We wish everybody would read the full speeches of Dr. Atkinson in the final report. Their fine logical web cannot be extracted, we only give a few aphorisms.

Miller was honest. Do you know, that it is the greatest insult to a man, to have it said of him, he is honest. I would rather like to take five hundred boys of ten years of age that have good English education to understand my English and agree to make them good anatomists, physicists, pathologists, therapeuticists and operators in five years, than take five graduates? Why? Because the latter have said: Error, be thou my truth. Darkness, be thou my light! That is what they have done from the Pope down.

Dr. Spalding.—I have long held that there was no pathology except that which proceeds from physiology; that there is no pathology, *per se*, neither in function nor in growth. The processes are all inverted or perverted physiological processes, and the growths are physiological growths out of place.

Our text books are full of descriptions of pathological anatomy, pathological growths and pathologicul processes. When, as Dr. Atkinson has just said, there are really no such things; but they are simply inversions of true physiological forces which arecalled pathological.

I only intended to enforce the idea advanced by Dr. Atkinson.

Dr. Barrett.—We spent considerable time this forenoon soaring in the infinite. Let us come down to a cash basis. We come here not to study or consider ghosts but material things. We all like to hear Dr. Atkinson, but the question up now is not to study the tracks, but the game. Let us go down to the actual demonstration and actual experiments. We cannot speak of the power of a bacterium, as that of a raging animal,boring into the teeth for the purpose of devouring living tissue, that is not the character of the fungi of caries, they are of a vegetable nature. Putrefactive and fermentative conditions, are almost the converse, putrefaction does not exist as the same time with fermentation. Forevery one experiment Prof. Mayr has made Dr. Miller has made fifty. According to my own stand-point, the rationale of decay is about like this. First there will be the decalcification of the exterior portion of the enamel; after the decalcification of the enamel the dentine is reached and on one—may be single—point, the lime salts are removed, the substance becomes a spongy mass, which takes up within its pores sacharine fluids from the mouth, which are favorable to the development of fermentive fungi; these fungi eat the spongy mass. In the course of their existence, they produce an acid which Dr.Miller proved to be lactic acid, which continues the work of decalcification and so ad infinitum.

Dr. Abbott.—Dr. Barrett said we ought to deal with actualities and not with ghosts. What we have been able to discern with the naked eye or the strongest power of the microscope. Does this put us into a position to say that there is nothing beyond? It was only a few years ago that microscopes which magnified 500 diameters were something wonderful—remarkable; but there must be something smaller and smaller, as Dr. Atkinson said, a ghost. Dr. Miller seems to neglect the fact that the tooth has 25 to 30 per cent. of organic material and is a live organ and considers too much the organic salts.

EVENING SESSION.

The Speaker demonstrated how former exploration of the growth of the enamel pulp and the dental grooves were due to falty preparations; the paper was elaborate and without the illustration of little instructive value. We can only advise our readers to get the full report of it; it is exceedingly valuable and well worth reading, and we do not remember to have listened to as lucid a demonstration of the intricate and dry microscopic details of the development of the enamel as that paper of Dr. Williams gives.

Dr. Atkinson.—I can hardly restrain my joy at the progress, made in dealing plainly and simply with the most profound research and interpretation of the manner in which the elements of the teeth are brought within the scope of our perception. Let us dilate a little upon the mannar in which we have been blessed by this very rare treat, the chairman of the committee of arrangements had the good fortune to secure.

The accident which happened to the child of Dr. Clifford of Waco, Texas, is reported, and the association passes a vote of sympathy, the president of the town is introduced and promises to act vigorously in the matter.

Dr. Atkinson.—Proceeding after this interesting story Dr. Spalding think it might be untender, but Dr. Atkinson replies of the best way to show sympathy is to go right ahead in our duty. Dr. Atkinson also adds some more historical explrnation as to the difference between the conceptions of the school in Philadelphia and Dr. Williams. Adjourned.

[TO BE CONTINUED.]

FLORIDA STATE DENTAL ASSOCIATION.

Pursuant to a call, a large number of the Dentists of Florida, met in Library Hall, Jacksonville, Fla., Oct. 15, 1884, and organized the "Florida State Dental Association," by the adoption of constitution, by-laws and code of ethics and the election of the following officers:

President, Dr. James Chace, Cedar Keys; First Vice-President, Dr. W. W. Towsend, Orlando; Second Vice-President, Dr. W. McL. Dancy, Jacksonville; Recording and Corresponding Secretary, Dr. Duff Post, Tampa; Treasurer, Dr. H. M. Graniss, Orlando.

A committee was appointed to draft a bill to be submitted to the State Legislature and the Secretary was instructed to mail to every dentist in the state a copy of a resolution, passed by the Association, requesting them to use their influence with their representatives in the Legislature to vote for the bill to become a law.

Dr. W. McL. Dancy, was unanimously elected a delegate to back the Southern and American Dental Associations.

Tampa was selected as the next place of meeting.

The Association then adjourned to meet in Tampa the first week in May, 1885.

DUFF POST,
Recording and Corresponding Sec'y.
Tampa, Fla.

CHICAGO DENTAL SOCIETY.

Reported by P. J. Kester, D. D. S., No. 628 West Lake Street.

The regular meeting of the Chicago Dental Society was held in the Chicago College of Dental Surgery rooms, Tuesday evening October 7, Dr. Harlan in the chair. The subject for the evening was Pregnancy and its effects on the teeth of the mother and child. The discussion was opened by Dr. Geo. H. Cushing. He said the inference was that there were adverse conditions during pregnancy. We are not prepared to admit that pregnancy is a disease, but the present state of society seems to make it so. which is true to such an extent that nearly every woman during this period considers herself a fit subject for the physician's care.

The effect upon the teeth of the mother or child, whether it be good or evil must be brought about through nutrition. During a healthy pregnancy the nutritive process is carried on at its height.

According to a German author it was found that in the mouths of anæmic patients the saliva swarms with leptothrix, and in many cases where death ensued, a post-mortem developed the fact that the liver also contained them in great numbers.

The teeth of the mother are affected during pregnancy by the general disturbance of the system and more especially the nutritive process; nausea, morbid appetite, etc, are some of the symptoms usually present, and that the child should suffer seems perfectly natural.

The treatment during this period can be summed up in the one word hygiene, a subject which we as dentists do not give the attention, that it merits.

Dr. Brophy.— Believes that morbid appetites during pregnancy are an index to the needs of the system and should be satisfied, and such food as will build up all of the tissues of the body should be provided.

Dr. Newkirk.—Hereditary influences are to be considered; whatever would affect the general health would affect the teeth.

That the teeth suffer during pregnancy is probably due to a lack of proper assimilation of the elements necessary to the nourishment of the system. As to treatment he would recommend out door exercise, pure air and simple wholesome food.

Dr. Wassall—There is one cause of the decay of the mother's teeth that has not been mentioned. Lack of care and attention, which may be called a local cause. That the fluids of the mouth are depraved during pregnancy, from disturbance of the general system, is a reason why the teeth should receive especial attention at this time.

Dr. Swain.—The effects of the general disturbance on the secretions of the mouth and lack of care would account for the great number of germs and micro-organisms found in the mouth.

Dr. Harlan.—If in the early stages of pregnancy the teeth are put in good condition, and properly taken care of, the fluids of the mouth are not liable to become vitiated. I have noticed that the teeth of patients with very dark or very light hair are less liable to decay then those of the medium shade. When white spots appear on the teeth during pregnancy, they can be removed and polished if seen soon after delivery, thus obviating the necessity for filling.

Syrup Lacto-Phos. of Lime may be given in doses of ½ to ⅓ tea spoonful to relieve the nausea of pregnancy.

MASSACHUSETTS DENTAL SOCIETY.

The twentieth annual meeting of the Massachusetts Dental Society will be held in the rooms of the Boston Medical Library Association No. 19 Boylston Place, Thursday and Friday, December 11 and 12, 1884, commencing at 11 o'clock Thursday.

W. E. PAGE D. M. D., Secretary.
11 Studio Building, 110 Tremont St.

Boston, Nov. 25, 1884.

JOURNALISTIC.

> **"Reading maketh a full man; conference, a ready man; and writing, an exact man."**

EXPERIMENTS ON MODELING COMPOSITION. By Stewart J. Spencer, D. D. S., San Francisco, appears as the second article in the October *Ohio State Journal.* He used two kinds of the material hard and soft, but does not tell us the composition of either. He thinks that where strong compression is required to equalize the pressure of a full plate on an irregularly hard and soft mouth, this composition used hard and with strong pressure is unparalleled as an impression material. With regard to its ulterior uses, he has found it well adapted for duplicating models, but his experience with it for base plates and articulating impressions has been decidedly unfavorable. In summing up he says, that it requires more skill and acquaintance with it, to take a correct impression, than with either plaster or wax, but if understood is very useful and nice to use. The harder material proved itself in these experiments to be the better in almost every instance.

CHEMISTRY (?) Dr. Watt in an editorial with this title endeavors to correct a false impression regarding arsenic. "That arsenic, in some way, continues to advance into dead tissue, we have demonstrated by taking a pieceof muscle from an ox. A piece half an inch long was laid on a fragment of clean glass. A very minute quantity of arsenic was applied to one end of the flesh, leaving no surplus or residue. It was kept in the dark, in a cool room, and, from time to time, slices were cut off from the distal end and tested. Several trials were made before arsenic was found, but it due time it permeated the entire piece of muscle. * * * Of the fact that arsenic is absorbed, or, at least that it permeates tissues to considerable distances beyond the points of its application, the proof is abundant and easily found."

THERAPEUTIC PROPERTIES OF TIN is also discussed by Dr. Watt. He says, that tin has no therapeutic influence, but it may be acted upon by chlorine and the chloride of tin is highly antiseptic. He says. "We can understand that tin, in contact with gold, and immersed in the buccal fluids is more likely to be chemically acted on and the action is likely to be more energetic than if the gold were not present."

FOR SENSIVIVE DENTINE.—*Items of Interest.*—"Dr. T. A. Robinson, it will be seen in our report of the American Dental Association, recommends equal parts, by weight, of carbolic acid and caustic potash ground together.

He applies in small portions to the cavity, and in a few minutes wipes it away, repeating it if necessary. He also finds it good as an application to aching exposed pulps preparatory to treatment. It sometimes gives a little pain—but not severe. He modified it, occasionally, by adding oil of cloves, or creasote, as in his judgment the case might require. He had used it for about twelve years with increasing satisfaction. He thinks it seldom needful to destroy exposed pulps."

"THE MINNESOTA DENTAL ASSOCIATION has had its first session. This State almost completes the circle of States; a few more left. Its officers for the ensuing year are taken from its best operators."

The *Items* must be mistaken in the above. In 1873 and 1874 we had the pleasure of attending the meetings of the Minnesota State Dental Association, and in the July number of the MISSOURI DENTAL JOURNAL, for 1875, we find the following:

DEAR SIR:—I enclose a synopsis of the proceedings of the

Fourth Annual Meeting of the Minnesota State Dental Association, with the request under instructions from the Society, that the same be published in your journal. Yours truly,

WALTER F. LEWIS,
Secretary M. S. D. A.

The Society has been sleeping for some years, and perhaps it has forgotten all about the past.

LEADING FLORIDA dentists were to meet at Jacksonville, October 15, to form a State Association.

DEODORIZED IODOFORM. *The Canadian Practitioner* contains the following formula:

Iodoform, - - - - -	18 grammes.
Sulphate of quinine, - - -	3 "
Powdered charcoal, - - -	15 "
Essence of peppermint, - - -	40 drops.

Thus prepared the iodoform may be associated with the ordinary liquid excipients.

THE MAINTENANCE OF HEALTH AMONGST THE PRACTITIONERS OF DENTAL SURGERY. Discussion upon Mr. Oakley Cole's paper read before the Odontological Society of Great Britain, published in *The British Journal of Dental Science.* Dr. George Field said he had had some experience of bad health, and he should be very glad to find a means of escaping it in the future. He thought the fact that dentists as a rule worked in a room with a northern aspect, was one element affecting their health; they did not get enough sunshine.

For the last four years he had worked under a southwest aspect, and he believed he had been better for it; the light was somewhat changeable, but he did not find this a serious objection. He was accustomed to work with a open window whenever the weather would permit.

There was the question of exercise, and as to this he would suggest to those who had not tried it a remedy which he had found eminently beneficial in his own case,viz.,the use of a tricycle. He had been accustomed to sit at his work for some years past. He used what was called a "shooter's walking-stick," which was very light, easily adjustable, and permitted great freedom of movement to the body. Itwas the best contrivance of the kind with which he was acquainted. H.

MISCELLANY.

TREPHINING OVER THE FRONTAL SINUSES

BY T. O. SUMMERS, M. D., JACKSONVILLE, FLA., FORMERLY OF NASHVILLE, TENN.

In the September number of the *Practitioner* I presented to your readers an interesting case of mastoid diseases relieved by the trephine. I have to offer you this month the report of a case, most remarkable in its history, and most satisfactory in its ultimate issue.

Several years ago, Mrs. P—., while holding a child in her lap was accidentally struck by the little fellow just over the upper and inner angle of the orbit, producing a contusion remarkably greater than might have been expected from such a blow. Her health at the time was bad, and before the ecchymosis had subsided, she was confined to her bed with typhoid pneumonia. In this low condition of her system, reparation of even the slightest injury was out of the question. Ulceration of the bruised spot set in and was rapidly destructive, denuding the bone and attacking in turn the thin shell which forms the outer wall of the frontal sinuses. The cavity was soon entered and from the posterior plate sprang up an osteo-fungoid pillar, like the stem of a young cauliflower, about 6 millimeters, or say a quarter of an inch in diameter. This was capped with a granulated efflorescence and altogether resembled a young mushroom before the umbrella is opened. The skin of the forehead fitted closely about the stem of this growth, which protruded about 5 millimeters above the plane of the integument. From this place a sanious pus continually exuded, and constant facial neuralgia rendered existence almost unbearable.

I examined the case August 6, and resolved to trephine the next day. Assisted by my associate, Dr. J. M. Coyle, I dissected the integument from about the pillar of osteo-fungoid, as I have termed it, and lifted it over the cap, the hole in the skin being bevelled at the expense of its external surface, and the edge resembling the selvege of cloth.

After planting the trephine, including in its crown the bony excresence, we bored down to the internal plate and finished with the dental engine by burrowing beneath the line of the trephine crown, bevelling down to the dura mater and then lifted out the button with the excresence attached. The internal plate was ulcerated and soft, but the dura mater beneath was intact. The patient has completely recovered without a single unfavorable symptom or the slightest vestige of facial neuralgia.

What was this excresence?

I have decided that it was an imperfect development of bone, not reaching the plane of physiological structure—a perverted nutrition the result of zymotic sanguification.

Southern Practitioner.

MONTHLY LIST OF PATENTS.

The monthly list of patents for inventions relating to Dentistry, bearing date October 21, 1884, reported expressly for this paper by Louis Bagger & Co., Mechanical Experts and Solicitors of Patents, Washington, D. C.

306,298. Dentists' file holder, J. Z. Walling, New York, N. Y.

305,900. Dental impression cup, R. F. Crowther, Baltimore, Md.

306,421. Disinfecting apparatus, S. W. Parker, and H. Blackman, New York, N. Y.

THE LATER ANESTHETIC.— About two hundred people of scientific inclination gathered at Market Hall, St. Paul, Minn., a few weeks ago, to listen to Dr. Howland's illustrated lecture on anesthesia. The stage was plentifully supplied with scientific apparatus, and the audience, though small as to numbers, found the lecture entertaining and instructive. Dr. Howland stated that from his own experiments and the practical operations in Paris, he believed that the administration of nitrous-oxide and air, or nitrous-oxide and oxygen, in condensed air chambers, will yet supersede the use of ether and chloroform in prolonged dental and surgical operations. The reason why nitrous-oxide cannot be used for prolonged operations, as ordinarily administered, is that the blood does not obtain any oxygen from it, the nitrous-oxide being exhaled from the lungs undecomposed; and if breathed without air, oxygen will produce asphyxia. He had administered nitrous-oxide for dental and surgical operations to more than 30,000 persons, and had found that when pure nitrous-oxide is administered without any admixture of air, the average time of producing anæsthesia is fifty seconds, and the average time from the first commencement of the breathing of the gas until the return of consciousness is two minutes. He claimed that anæsthesia can be produced for prolonged operations, by means of nitrous-oxide, eighty-five parts, and oxygen, fifteen parts, without danger of unpleasant sensations. The lecturer next proceeded to demonstrate his theory, using a chicken for that purpose. The chicken was put in a small air chamber and condensed nitrous-oxide forced from a rubber bag into it, and after a brief space oxygen was added. The chicken was found to be thoroughly anæstheized. The audience filed upon the stage and inspected the "subject," after which it was restored to consciousness, and was apparently as well as ever. The lecturer instanced several important surgical operations which had been performed through this new agency in Europe and in America, and concluded, after some further interesting scientific demonstrations, by claiming that the time would soon come when chloroform and ether would be superseded by this new and harmless anæsthetic.

AMALGAM NOTE.—Dr. Bogue at a recent meeting the New York Odontological Society, said:

"I must confess my disappointment when I hear gentlemen of The Odontological Society speak of squeezing their amalgam, and I am not surprised that any gentleman who manipulates his amalgam this way should find it utterly unreliable.

"It is not much more than a month since one of my professional brethren said to me, 'What do you mean by weighing the component parts of your amalgam;I could not spend the time, how do you do it?' Now I supposed that every member of this Society knew a Fletcher Balance as well as I know a water jug. This gentleman did not. I showed him how to use it and he acknowledged it was a good thing.

"I frequently see the names of gentlemen belonging to the Odontological Society are given to the makers of amalgams, certifying this: 'Your amalgam is the best I have ever used,' etc. Either this means something or it means nothing. If he has carefully tested by mechanical and chemical tests, and by specific gravity, and knows whereof he affirms, that testimony ought to be valuable,but if he merely guesses and tells of some fillings he guesses have been in six months or guesses they have been in six years, and says they look well; if he rubs the amalgam in his hand and says, 'Yes, I will give you a certificate,' it does not show that in this 'district school' we are learning a great deal."

EDITORIAL.

The subject of pulpless teeth has been under discussion in late numbers of the *Medical Record*, and the opinion has been expressed by a contributor, and endorsed by the editor, that all such teeth should be promptly removed from the jaws.

The subject was introduced by Samuel Sexton M. D., who expressed the belief that since dead and diseased teeth have been so carefully retained by dentists, nervous diseases about the head have become alarmingly common; and he closed his communication by saying that "he sometimes thought the evil done by ill-advised dentistry was greater than the possible good arising from the work of the more capable dentists."

Dr. Sexton's observations upon the patients of a public infirmary are no doubt mainly limited to persons who employ inferior dentists whose operations are no more comparable with those of the "more capable dentists" than are the practices of quack doctors with those of the more capable physicians.

But how happens it that so much of this "ill-advised dentistry" is done? The reason is obvious. Until within a very few years any one who chose, could engage in the practice of dentistry, and no matter how incompetent he may be, persevering advertising would bring him subjects, and as neither the public nor the physicians were, or are capable of judging the quality of a dental operation, a good deal of work would be done, and much money collected before the incompetence of such advertising dentist would be ascertained. The money received would pay for more advertising and thus bring more victims, and so the work would go on *ad-in-definitum*, as well as *ad-nauseum*. It is our deliberately expressed conviction that there is in the community no other equally intelligent class who are responsible for this state of things to the same extent as are medical men. If they do not encourage "ill-advised dentistry" they do not discourage it. They are often looked to for advice on this subject by their clientage, who we regret to say, are sometimes illy advised.

Dentists have struggled hard and long to rid their profession of this incubus which brings them into disrepute, and their efforts in this direction have met with little support from the medical profession. There are notable and noble exceptions to this statement we know, and they are duly respected and honored.

The editor of tne *Medical Record* speaks of the "peril of tooth-saving" as if there was danger in the attempt. This every intelligent dentist knows is a misapprehension. As well might *we* complain of the perils of finger-saving in a case of felon, or of eye-saving in a case of iritis or of cataract, or of limb-saving in a case of abscess.

Pulpless teeth are not necessarily dead. The terms "pulpless teeth" and "dead teeth" are by no means synonymous.

Is not an inflamed tooth-pulp or periosteum amenable to treatment on the same principles as are inflammations in other organs and tissues? Let the editor of the *Medical Record* answer! If evidence were needed to demonstrate the necessity for the better education of physicians in diseases of the teeth, the articles under discussion would afford that evidence. The fact that physicians are so illy informed upon this subject is not so much their fault as it is their misfortune. Medical text books contain little or nothing upon dental diseases, and no more is taught, at least until very recently, in medical schools. Consequently, they could not be expected to be well-informed upon this subject, and should not be held responsible for the errors of diagnosis and prognosis which they so often commit when attempting to pass upon either the nature or the causes of diseases of the teeth, or of reflex or sympathetic affections arising therefrom. The remedy for the whole difficulty is very simple. It consists in the better education of dentists in certain branches of medicine, and the better education of physicians in certain branches of dentistry.

The former is now well provided for by the dental colleges, and the importance of the latter has already been recognized and acted upon by a portion of the medical schools.

The present duty of physicians is to exercise more care in the selection of the dentists whom they recommend, and to avoid casting upon the dental profession the sins of uneducated and incompetent men who call themselves dentists, but are not recognized by any of the organized bodies of that profession.

The chief difficulty of the position at this time, and the main cause of complaint against physicians is, that as a rule, they do not properly discriminate between the educated and the uneducated practitioners of our art. SIGMA.

The article on the Histogeny and Histology of the teeth, translated from the French for this journal, and published in this and the preceeding numbers, will furnish to such of our readers, as are familiar with the subjects treated of, a convenient compendium of the views that prevail on the continent of Europe at this time upon this important branch of dental science, and at the same time afford an opportunity for comparison with those held in this country. To those who have not studied the subject attentively, the translation will present the matter in a brief yet comprehensive way, which will impart ideas upon the subject in a manner clear enough to enlist their interest and lead them to the future study of subject for themselves. Its careful perusal, will, we feel sure, interest both classes, and to the latter serve as a synopsis, which will stimulate to a study of the subject more in detail.

It is not often the case, when one gets married, that the event is spoken of as a "death," or that one of the parties to the transaction is referred to as "deceased," etc. Some of our cotemporaries, in referring editorially to the recent *consolidation* of the ARCHIVES and the *New England Journal of Dentistry*, either misunderstand a plain statement or wish to mislead the profession. To record, without modification, of the *New England Journal of Dentistry* that it is "no more" is a mistake. To state, in an unqualified manner that it has "succumbed" is—if the word is used intentionally and with an intelligent appreciation of its true meaning—an egregious mistake.

The New England Journal protests that it is not ready for an obituary notice; that it is not "deceased." Neither have its editors "dried" their "pens." "Self-denying labors have not ceased' and "weary brains" refuse the "rest" to which they are consigned.

A simple change in names or, in other words, "getting married," does not warrant or justify a friendly cotemporary in the use of such terms as "deceased," "succumbed," etc. There is nothing of the kind involved in the transaction, and the editors of *The New England Journal* decline to be buried by means of sugar coated obituary notices. They have other "fallacies" to maintain and rejoice that the new arrangement affords a larger field in which to disseminate them.

Some months since we intimated that an iridium gold would be a good thing, and soon we were in receipt of some, from two sources, in the form of heavy foil, and upon practical tests, it proved no improvement upon the platinum gold, shade 3. A rich alloy of the metal does not work favorably in the form of foil, and we wish to suggest that some crystalline form of iridium, or iridium and platinum, electro-gilded,would probably accomplish the desired result, a hard enamel surface for gold fillings. M.

To an itinerant dentist who traveled through the Southern states thirty years ago, credit should be given for combining gold and tin in alternate layers, gilding his tin-foil with gold leaf, and collecting fees for gold fillings. M.

In consequence of an unexpected delay in the preparation of the title page and index to both the ARCHIVES and the *New England Journal of Dentistry* they will be mailed when completed.

Back numbers of *The New England Journal of Dentistry*, also a few full sets of the same can be had by addressing, Dr. C. T. Stockwell, Springfield, Mass.

A WORD TO EARNEST WORKERS.

Instruct your patients to take proper care of their mouths to brush the teeth and gums after meals, rinse the mouth with tepid water, pick the teeth with small quill tooth-pick, and use a narrow strip of rubber dam to cleanse spaces too narrow for the quill to go through. Be the decay caused by chemical or parasitical agents, we know they thrive only in filthy mouths, and that cleanliness is death to them. Such care will prevent more bungling dentistry than all theories combined, and when our microscopists return from their little trip, "all among the little stars sailing around the moon," they will be able to find those little fellows with black heads and red eyes. M.

PUBLISHERS SPECIAL NOTICE.

The publishers of the ARCHIVES of DENTISTRY are engaged solely in the printing and publishing business, and have embarked in this enterprize in the belief that the dental profession are ready to patronize and sustain a *strictly first class* INDEPENDENT journal such as the ARCHIVES now is and will continue to be.

The Dental Journal Association, which controls the columns of the ARCHIVES was organized solely in the interests of the profession of dentistry, and its members contribute their money, their time and their talents to the end that the periodical literature of dentistsy in this country' may be relieved of the interests of trade and become established upon the same basis as the periodical literature of other learned professions.

The business of this journal will therefore be conducted as is that of the periodicals of other professions, upon a money basis; consequently, while first class advertisements are hereby solicited, and our circulation is large enough to attract such advertisements, payment therefor cannot be accepted in anything but money or its equivelant.

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